THE PAPER INDUSTRY

ECHNOLOGY DEPT.

and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—NOVEMBER, 1944

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DETROIT

CANTILEVER SUCTION COUCH ROLLS

SUCTION PRESS ROLLS

SUCTION FELT ROLLS

SUCTION EXTRACTOR ROLLS

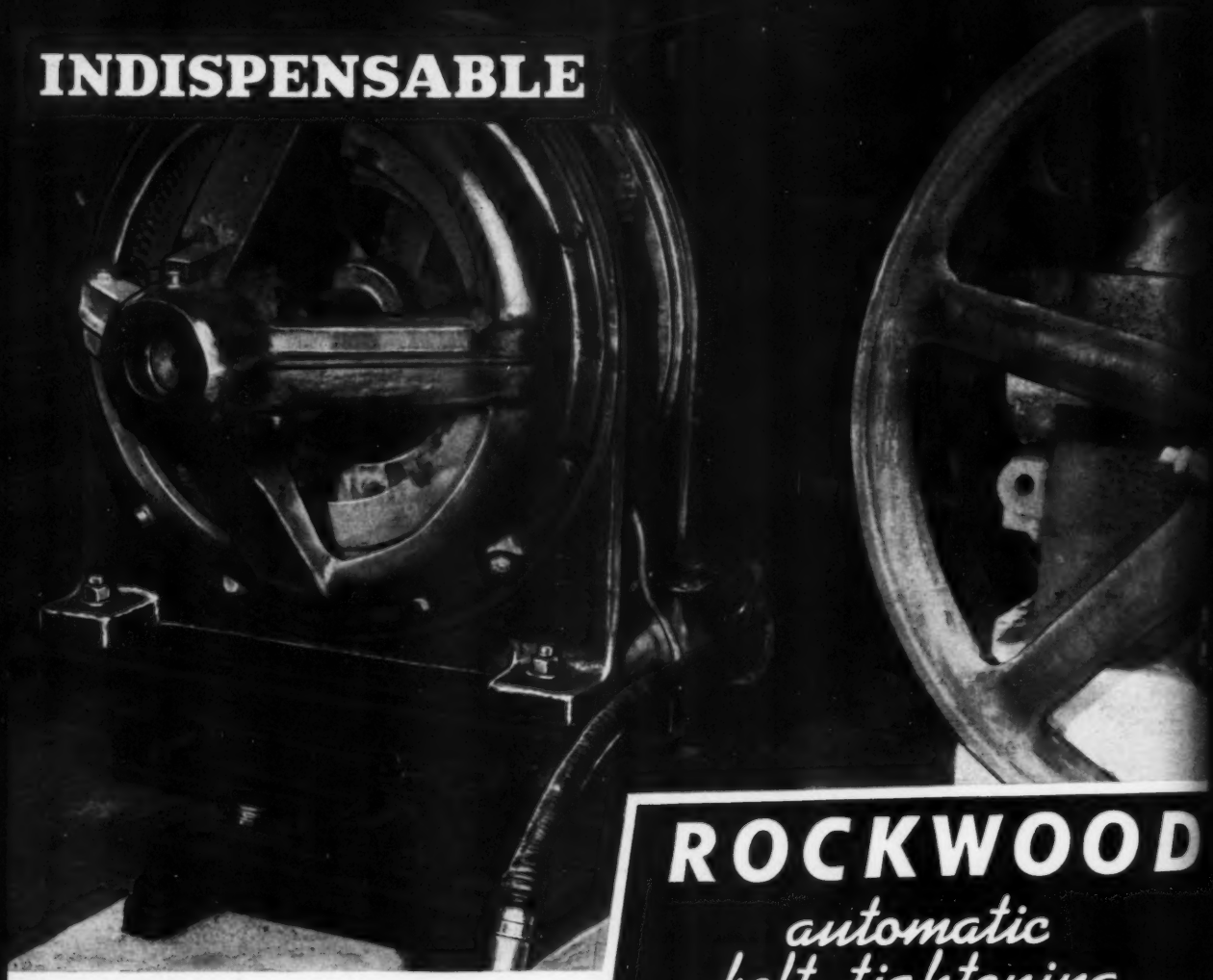
SUCTION CYLINDER COUCH ROLLS

Must in War First in Peace

Wartime operation of paper and board machines has put a new value on the indispensability of suction rolls. They deserve first place in your post-war plans, but before you choose, compare designs and mechanical constructions. Remember, what goes in, in quality, comes out in satisfaction. Catalogs on request. Downingtown Mfg. Co., Downingtown, Penna.

A MACHINE IS JUDGED BY ITS NUMBER OF SUCTION ROLLS

INDISPENSABLE



Rockwood automatic belt tightening Motor Base driving to air compressor—Oxford Paper Co. plant, Rumford, Maine. Belt slip is now practically eliminated. The compressor capacity is increased. Its performance made more dependable. The belt tightness matches the load—increasing when the load increases —falling off when the load falls off—AUTOMATICALLY.

ROCKWOOD *automatic belt tightening* MOTOR BASES

IMPROVES PAPER MILL MACHINE PERFORMANCE

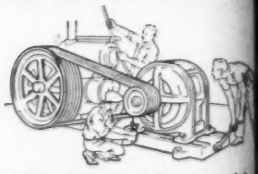
Most paper mill engineers are frank to state they are interested in anything that will give improved machine performance and not take too long to pay for itself.

That is exactly what Rockwood automatic belt tightening motor bases do for paper mills. Your beaters, compressors, vacuum pumps, and other motor-belt driven machines — ALL WILL OPERATE CONTINUOUSLY AT MAXIMUM SPEEDS —through load peaks and all—with less attention—and less work for your maintenance crew. The machines then will do more and better work and you make a good saving by buying fewer belts. You also save up to 10% in power.

Every Rockwood drive will, we believe, pay for itself in less than a year. Most all paper mills have Rockwood Bases on many drives now—and intend to put them on others as soon as the present belts wear out.

You can still get reasonably prompt delivery *considering the times.* We still aim to keep bases in stock up to 60 h.p.—in semi-stock to 250 h.p.—and don't take too long on special built larger sizes. *If you have a drive that needs correcting write us.*

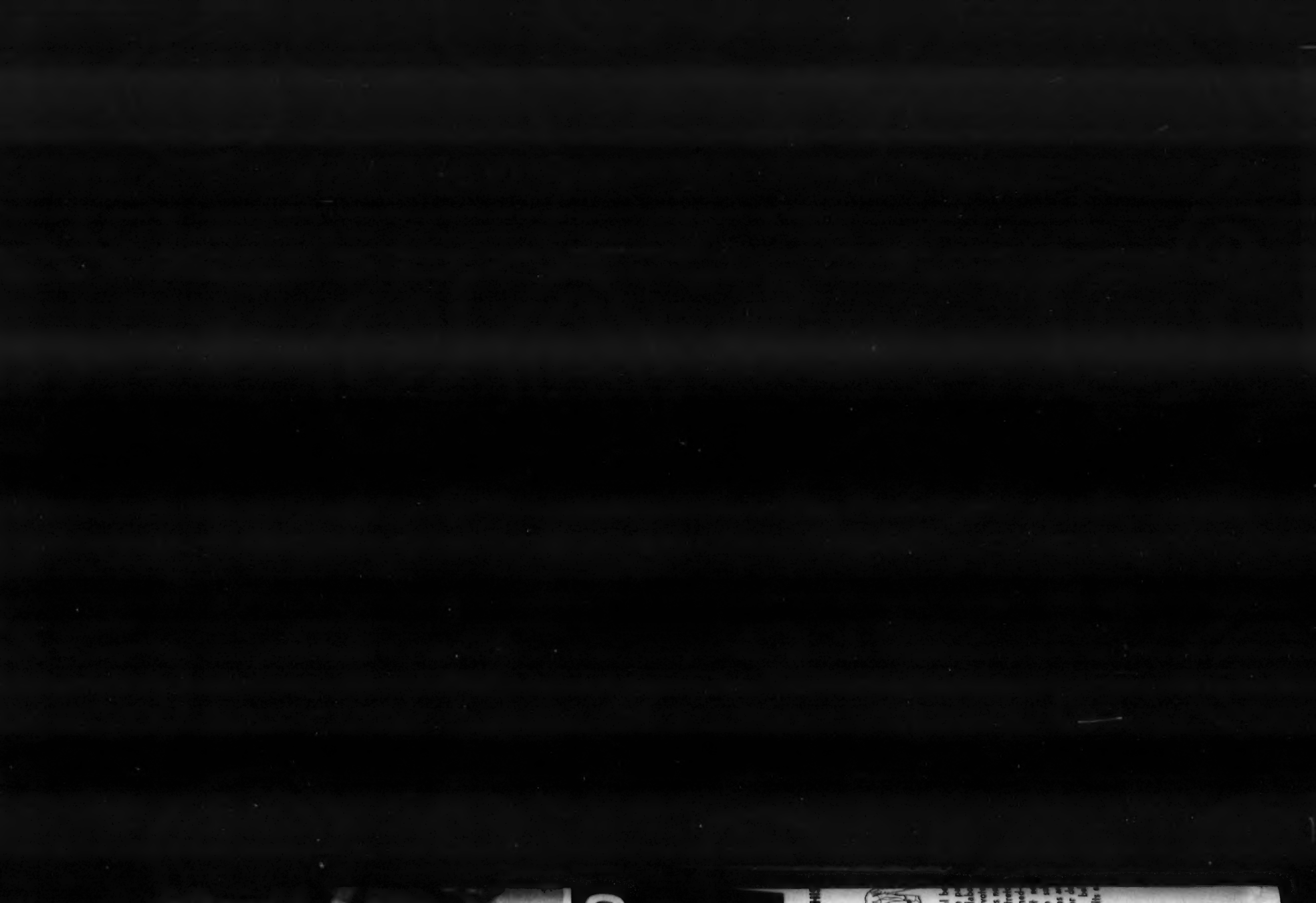
DO AWAY WITH THIS



Costly shut downs for manual be tightening are a thing of the pa —too wasteful of time and labo Thanks to the Rockwood pivote motor base, belt tightening is no made automatic. Belts that stret are automatically re-tightened— and made neither too tight n too loose, but just right to m varying loads. Rockwood bases a the biggest improvement ever de veloped for electric motor be drives. Use with either V-belts o flat belts.

ROCKWOOD
INDIANAPOLIS • U.S.A.
Specialists in Power Transmission Equipment Since 1884

Rockwood are the largest manufacturers of pulley in the world. After the war they will have 1,447 stock sizes ready to ship. Then their stocks of V-belts and V-sheaves will be enormous—with 7,889 stock sizes of sheaves—and every size and length of V-belt—all ready for immediate delivery—and unequalled stocks of all three—with pivoted motor bases—in the hands of warehouse dealers in nearly every large industrial center.



IN THE PAPER MACHINE TRADITION
Sorry we had to tip this picture on its side, but it gives you a better idea of the size of this crankpin turning lathe . . . what might be called Beloit's largest contribution to war work. Completely assembled, it weighs approximately 225,000 pounds, yet it's a precision tool. We're proud of it and the others developed and built by Beloit engineers and craftsmen . . . creators of paper machines and paper-making innovations since 1858.
Buy War Bonds for Victory!
BELOIT IRON WORKS
PAPER MACHINERY
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SERVING UNCLE SAM
1ST
FOR THE DURATION
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BELOIT IRON WORKS, BELOIT, WIS.
WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

25%

MORE CAPACITY!

From the same process equipment—merely by a change in the method of handling the condensate

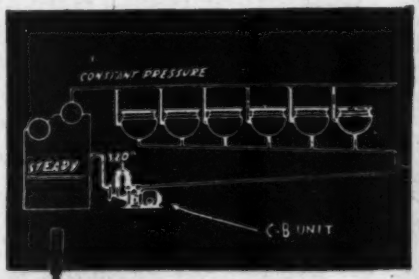
Are you interested in increasing production—and at the same time saving fuel? Of course you are! That is why you are sure to be interested in the Cochrane C-B System of High Pressure Condensate Return.

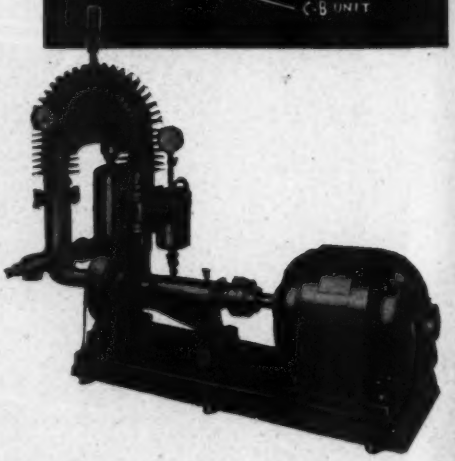
The results from the installation of the C-B System in processes using steam for cooking or drying are simply amazing. Fuel Savings up to 25% are not only possible but have often been exceeded. Production increases equally high are common and time savings and labor savings add to the overall economies.

Why shouldn't these savings be yours? The method of securing them is simple. You merely change from your open system of condensate return to the C-B Closed System installing the C-B unit, consisting of JET-pump, priming loop, strainer and air separator. Because the system is closed, there is no flash loss and condensate is returned to the boiler at close-to-process temperatures.

Dozens of enthusiastic letters on file show how many leading manufacturers have increased production, saved on fuel costs, raised the quality and increased the uniformity of that quality. These results are a matter of record and are merely indications of what can be done.

The wise manager looking to post-war competition will investigate the C-B System NOW. Write at once for complete information or consult our nearest representative.





COCHRANE CORPORATION • 3114 N. 17th St., Philadelphia 32, Pa.

COCHRANE C-B SYSTEM

CONDENSATE RETURNED TO BOILERS AT HIGH PRESSURE AND HIGH TEMPERATURE

PHILCO IS READY TO REDUCE YOUR POST-WAR BATTERY COSTS

THE NEW "PHILCO THIRTY" *Gives 30% Longer Life*

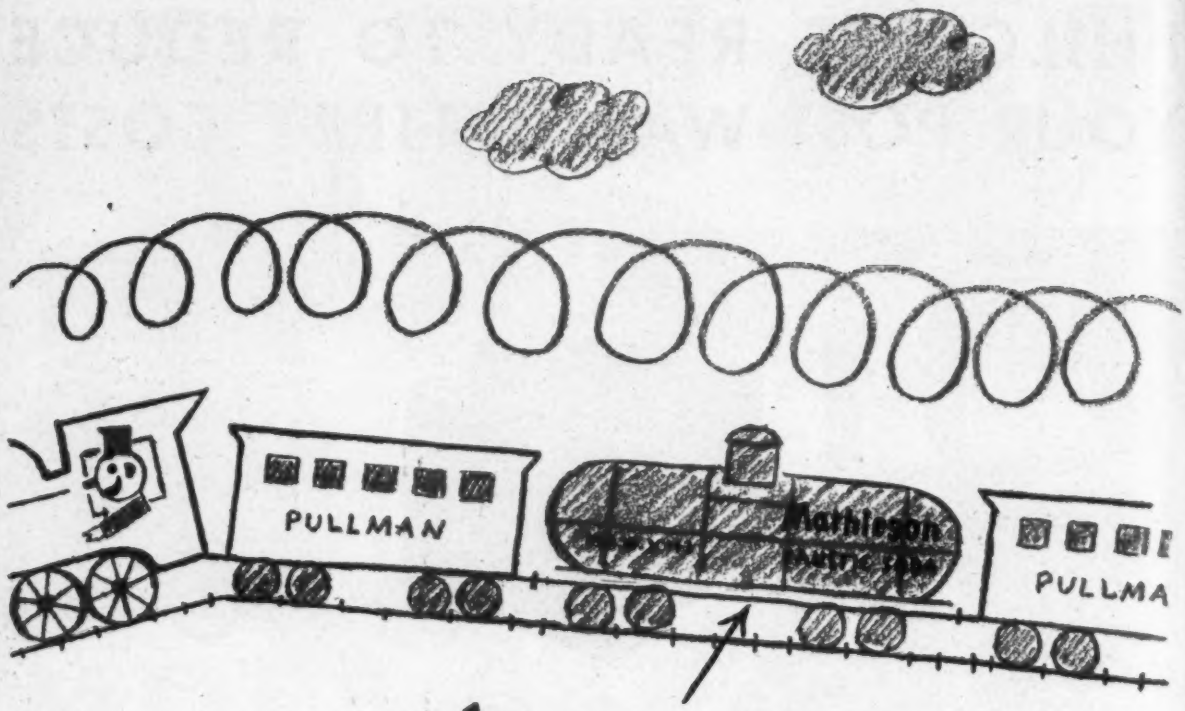
Storage battery purchases made from now on, are essentially a post-war investment. So be sure to keep posted on this sensational post-war Philco Battery development—the new Philco Thirty that gives 30% longer life! Here, at last, is a really revolutionary new long-life construction—employing a brand new principle of FABRICATED INSULATION!* It's available now in certain types and limited quantities. And as rapidly as war time restrictions are eased, Philco will make it possible for every user of electric industrial trucks to share in the new economy and more efficient operation of this great new battery. Write today for information. **Patent Applied for*

PHILCO CORPORATION, STORAGE BATTERY DIVISION
TRENTON 7, NEW JERSEY

Specify

PHILCO
INDUSTRIAL TRUCK
BATTERIES

FOR 50 YEARS A LEADER IN INDUSTRIAL STORAGE BATTERY DEVELOPMENT



it hasn't happened yet-

NO, we haven't yet had to attempt passenger train service to meet delivery schedules for war-vital Mathieson Caustic Soda. The great Mathieson fleet of tank cars rides the rails with guns, tanks, airplane parts—definitely travels first-class.

And no Pullman car is more carefully groomed between trips than a Mathieson Liquid Caustic tank car. Each is minutely inspected and cleaned at our own car shops—checked to assure fast delivery of clean, pure caustic for the thousand-fold job it does to speed Victory. Yes—because of the grand job the railroads are doing to move war supplies and Mathieson's attention to important details—it's first-class transportation for a top-class product!

Mathieson
CHEMICALS

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CAUSTIC SODA . . SODA ASH . . BICARBONATE OF SODA . . LIQUID CHLORINE . . BLEACHING POWDER . . H T H PRODUCTS . . AMMONIA, ANHYDROUS & AQUA . . FUSED ALKALI PRODUCTS . . SYNTHETIC SALT CAKE . . DRY ICE . . CARBONIC GAS . . SODIUM CHLORITE PRODUCTS . . SODIUM METHYLATE

THE PAPER INDUSTRY
and PAPER WORLD

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EVAPORATION IS A SLOW PROCESS

So long as evaporation is necessary for complete removal of water you can hasten the drying of your sheets either by increasing the heat of the rolls or by reducing the speed of your machines. The former means excessive consumption of fuel—the latter, drastic curtailment of tonnage.

Smart papermakers solve the problem with Hamilton Felts. By removing more water at the wet end, Hamilton Felts correspondingly reduce the amount to be evaporated at the rolls. This results in higher speeds and lower fuel costs. The better formation of the finished product and the saving in broke are just so much "velvet."

From the thinnest tissue to the heaviest board, there is a Hamilton Felt that will do your work better, faster, and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

Cooper DENSICAST FOR LONG LIFE

DIGESTER
NECK CASTING

The refined grain structure of Densicast stainless castings makes them stand up longer in sulphite-mill service. This denser structure is secured without altering the chemical composition of standard analyses. The structure does raise the physicals and increases the corrosion-resistance of Densicast stainless, and it does so to a marked extent.

THE COOPER ALLOY FOUNDRY CO.
125 Bloy St., Hillside, N. J.

Cooper ALLOY FOUNDRY CO.
STAINLESS MONEL NICKEL

THE *Only* ALLOY FOUNDRY WITH *All* THESE FACILITIES

- Laboratory control over raw materials and finished products.
- Dual foundry . . . both hand and machine molding.
- Electric arc and high-frequency-induction melting furnaces.
- Centrifugally-cast castings.
- Heat treating of Castings up to six feet.
- X-ray and Gamma-ray inspection.
- Precision Castings.
- Machine shop . . . specially equipped for finishing stainless steel.
- Improved cleaning . . . including Lustracast electrolytic finishing which leaves all surfaces bright.
- Castings furnished rough, polished or fully machined . . . one ounce to two tons.
- Development of special alloys to meet unusual requirements.
- Technical consulting service.

ARMY E NAVY

IT "HOLDS UP"

LIGHT–STABLE
MAINTAINS CONSTANT VISCOSITY
PRODUCES CONSISTENT RESULTS

From the original formulation to the actual application in your product, Methocel is stable. Its rugged film-forming qualities—its wide viscosity range and chemical compatibility—"hold up" under the most exacting requirements. Whether in its original solid form or in liquid, Methocel maintains constant chemical stability. Odorless, colorless and nontoxic, this water soluble material is also resistant to alkalies, dilute acids, fermentation and mold growth.

METHOCEL
THE UNIFORM SIZING MATERIAL

The unusual ability of Methocel to hold varying types of inks has proven of great interest to the trade. The colorless and odorless features of Methocel, plus its effectiveness in paper sizing, suggest many additional advantages. The use of Methocel as a retarding surface coating for oils, greases, paraffin and paper lacquers at low cost is now an established practice. Combine this with its consistent ability to produce uniform results plus its stability to hold up under most trying conditions. Consult Dow Technical Service for additional data.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit
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METHOCEL

Among the many Dow Products serving the Paper Industry are: Ethocel, Dowicides and Caustic Soda.

DOW
CHEMICALS INDISPENSABLE
TO INDUSTRY AND VICTORY

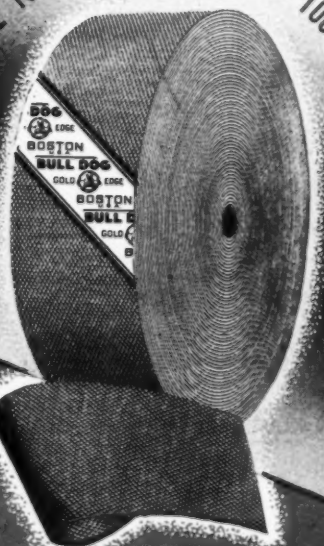
...IN SERVICE 15 YEARS

THIS Bull Dog Transmission Belt is operating on a Beater drive in a paper mill. This is a heavy duty job and the belt works under high stress.

Bull Dog meets the severest requirements of endurance, adaptability, long life, and minimum operating expense.

Bull Dog is widely used in paper and board mills, stone-crushing plants, cement mills, the lumber industry, ore-crushing and refining plants, brick plants, planing mills, and the textile industry. It is well worth your investigation for any driving need.

NO DRIVE TOO HARD • NO SERVICE TOO SEVERE



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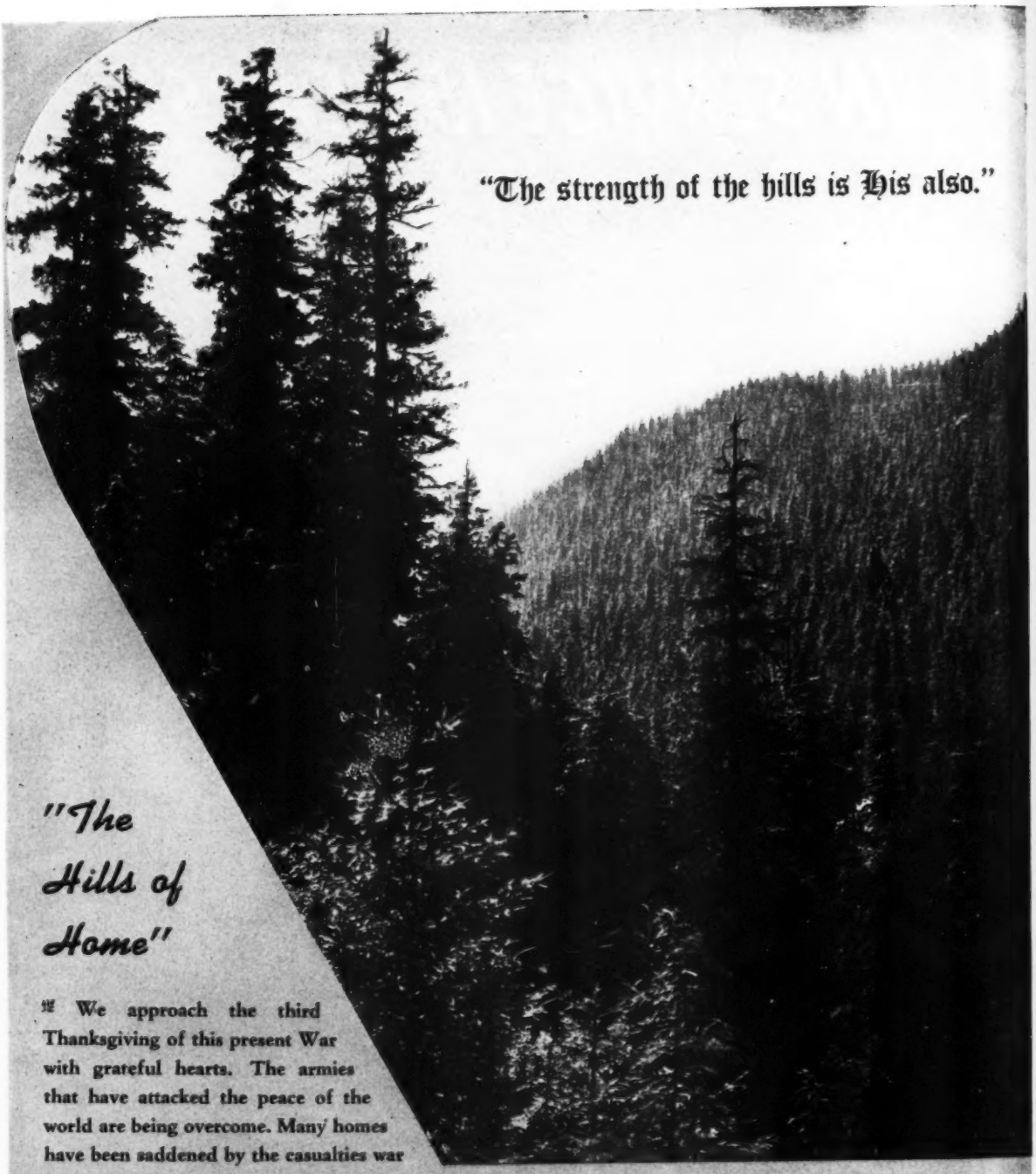


"The Hills of Home"

We approach the third Thanksgiving of this present War with grateful hearts. The armies that have attacked the peace of the world are being overcome. Many homes have been saddened by the casualties war brings, but the patriotism of those who have given sacrifice is the golden thread in the fabric of freedom. One may look at our flag and almost see there the shining radiance of all that has been given to preserve that freedom. That light will shine on. For this, every American should bow in deepest gratitude.

Just as the majesty and strength of the earth's forces for infinite good are symbolized by towering peaks and giant trees, so do the armies of peaceful nations break through the mists of war and stand clearly against the bright vista of the future.

America's armies fighting for peace are moving toward Victory. The hills of their homeland produce much that will help them to win that peace. The paper industry and all industries that depend upon our forests may well join in repeating that verse from the Psalms: "I will lift up mine eyes unto the hills from whence cometh my help."

TRADE WINDS

★ ★ ★

Regional Pulpwood Reports Show Decline

▸▸▸ RECENT RELEASES FROM the War Activities Committee outline the pulpwood situation, in general, and by sections. The following releases from the Committee give the latest figures on pulpwood:

Appalachian Pulpwood Receipts Decline

Increased pulpwood production is necessary this fall and winter if pulp and paper mills are to meet 1945 requirements for military and essential civilian items, the Forest Products Bureau of the War Production Board reports.

Mill receipts of pulpwood in September showed a decline nationally for the first time since April, indicating a tapering off for the remainder of the year unless the downward trend is reversed.

September receipts in the Appalachian region were 126,100 cords or about 6 per cent above a year ago, and 24,000 cords under last August. For the first nine months of this year Appalachian mill receipts were 29 per cent higher than during the equivalent period in 1943. However, indications are that the amounts of peeled wood available to the mills are less than desired and pulp production difficulties may develop out of this situation, the WPB stated.

Pulpwood imports by Appalachian mills totalled 1,400 cords in September and 5,000 cords during the first nine months of 1944.

Urgent requirements of mills in the Appalachian region are for a better quality of pulpwood, cut to meet mill specification, the WPB said. Much manpower has been wasted and transportation facilities burdened by the production of pulpwood that does not meet minimum diameter and quality specifications.

Total pulpwood receipts throughout the United States, including imports, were approximately 1,445,200 cords in September. Of this total, 1,250,000 cords were domestically produced. The over-all mill receipts were only 1 per cent above those of the same month a year ago and 4 per cent below 1942. Domestic wood receipts were 4 per cent above 1943 and 1 per cent above 1942.

During the first nine months of 1944 mill receipts of domestic pulpwood totalled 11,578,000 cords. This represents an increase of 21 per cent over the corresponding period of 1943, when pulpwood production reached its lowest level, and is about equal to the 1942 record production.

Pulpwood Mill Labor Shortage Critical

Pulpwood receipts by southern mills during September showed their first decline in 1944, reflecting a seasonal drop due to the agricultural harvest. Nevertheless, September receipts were 12 per cent above the same month last year and the highest on record for this period.

The War Production Board warned, however, that "a most critical situation exists with respect to wood-yard labor at pulp mills in the South.

"Lacking an adequate supply of wood-yard labor," WPB said, "it is impossible for the pulp mills to handle the volume of wood cut and shipped and which is needed to operate the mills at capacity."

September pulpwood receipts in the South totalled 551,500 cords as against 704,000 cords in August. Pulpwood deliveries to Southern mills during the first nine months of 1944 totalled 5,169,000 cords.

Urgent requirements of mills in the South are for a better quality of pulpwood, cut to meet mill specifications, the WPB said. "Much manpower has been wasted and transportation facilities burdened by the production of pulpwood that does not meet minimum diameter and quality specifications," it added.

Total pulpwood receipts throughout the United States, including imports, were approximately 1,445,200 cords in September. Of this total, 1,250,000 cords were domestically produced. The over-all mill receipts were only 1 per cent above those of the same month a year ago and 4 per cent below 1942. Domestic wood receipts were 4 per cent above 1943 and 1 per cent above 1942.

During the first nine months of 1944 mill receipts of domestic pulpwood totaled 11,578,000 cords. This represents an increase of 21 per cent over the corresponding period of 1943, when pulpwood production reached its lowest level, and is about equal to the 1942 record production.

Mill receipts of pulpwood for September showed a decline over the country for the first time since April, indicating a tapering off for the remainder of the year unless the downward trend is reversed.

Pulpwood Supply Most Critical in Northeast

Increased pulpwood production, especially of the long fiber species in the Northeast, is necessary this fall and

★ ★ ★

winter if pulp and paper mills are to meet 1945 requirements for military and essential civilian items.

Urgent requirements of mills in the Northeast are for spruce, fir and other long fiber wood, and some mills are currently over-stocked with hardwoods.

The most critical pulpwood supply situation in September throughout the United States was in the Northeast. Domestic receipts were 23 per cent below 1943 and 11 per cent under 1942. Farm pulpwood production, however, held up better than company operations, dropping only 3 per cent under a year ago as against a 41 per cent slump in company woods receipts.

September receipts of domestically produced pulpwood amounted to 183,300 cords. Pulpwood deliveries to Northeastern mills during the first nine months of 1944 totaled 1,491,000 cords. Canadian pulpwood imports amounted to 117,400 cords in September and 808,000 cords during the nine-month period.

Imports of Canadian pulpwood by Northeast mills for September were 6 per cent under 1943 and for the nine months 4 per cent below those of a year ago.

Pulpwood inventories in the Northeast are 19 per cent below a year ago and 40 per cent under what might be considered normal. This reduction in inventories is made more serious in that larger amounts of spruce, fir and other long-fiber soft woods must be produced to utilize hardwood supplies now in mill yards.

Unless pulpwood production can be substantially increased in the Northeast before winter hampers woods work, the War Production Board stated the 1944-45 wood pulp requirements from this region for military and essential civilian needs cannot be met.

Total pulpwood receipts throughout the United States, including imports, were approximately 1,445,200 cords in September. Of this total, 1,250,000 cords were domestically produced. The over-all mill receipts were only 1 per cent above those of the same month a year ago and 4 per cent below 1942. Domestic wood receipts were 4 per cent above 1943 and 1 per cent above 1942.

Lake States Pulpwood Receipts Show Decline

Increased pulpwood production, especially of the long fiber species in the Lake states, is necessary this fall and winter if pulp and paper mills are to meet 1945 requirements for military and essential civilian items.

Mill receipts of pulpwood for September showed a decline for the first time since May, indicating a tapering off for the remainder of the year unless the downward trend is reversed.

Urgent requirements of mills in the Lake States are for spruce, fir and other long fiber wood, and some mills are currently over-stocked with hardwoods.

September domestic receipts in the Lake States were 149,100 cords, or about 18 per cent above the like period in 1943 and 1942. Inventories in this region are up 27 per cent over a year ago but are 15 per cent below those of 1942. A year ago inventories were extremely low and the improved inventory position reflects the production of a large quantity of rough hardwoods during the 1943-44 season. This excess inventory of hardwoods cannot be utilized until long fibered wood, spruce and fir are available in greater quantities. Intensified efforts to produce the urgently required spruce and fir this fall and winter are necessary.

Pulpwood imports by Lake States mills totaled 64,800 cords in September and 385,000 cords during the first nine months of 1944.

Total pulpwood receipts throughout the United States, including imports, were approximately 1,445,200 cords in September. Of this total, 1,250,000 cords were domestically produced. The over-all mill receipts were only 1 per cent above those of the same month a year ago and 4 per cent below 1942. Domestic wood receipts were 4 per cent above 1943 and 1 per cent above 1942.

During the first nine months of 1944 mill receipts of domestic pulpwood totaled 11,578,000 cords. This represents an increase of 21 per cent over the corresponding period of 1943, when pulpwood production reached its lowest level, and is about equal to the 1942 record production.

◆

TREES FOR TOMORROW OFFERS SCHOLARSHIPS TO H. S. STUDENTS

Trees for Tomorrow, Inc., is sponsoring a forestry school scholarship program dedicated to future foresters in the State of Wisconsin, and to the memory of E. M. Griffith, Wisconsin's first State Forester (1904-1915), who pioneered a forestland use program for the cutover region of Northern Wisconsin.

This competition for the first annual $2,500 in forestry scholarship awards is open to high school students in the Wisconsin River Valley. Awards will be announced the latter part of May, 1945. Underclassmen and seniors who are interested should list their names with their high school principal.

Trees for Tomorrow, Inc., is an organization of the Wisconsin Valley paper-making industry, dedicated to the advancement of reforestation in Wisconsin. Offices are maintained at 916 E. Main Street, Merrill, Wisconsin, with M. N. Taylor, executive director.

◆

NON-TECHNICAL COURSE IN PULP AND PAPER

The pulp and paper industry of Wisconsin in co-operation with the Vocational Schools of Neenah, Menasha, Kaukauna, Kimberly, and Appleton in offering a non-technical course in pulp and paper to mill employees. Only employees of the pulp and paper industry will be eligible.

Classes are scheduled through February — twelve meetings, of ninety minutes and two-hour periods. Courses have been printed and lectures arranged by authorities on various subjects from the industry. If the registration is sufficient, classes will be held in Menasha and Appleton, otherwise classes all will be held in the Vocational School auditorium in Appleton.

◆

B-F-D CO. ACQUIRES ALGONQUIN PAPER CORP.

The purchase of the Algonquin Paper Corporation of Ogdensburg, New York, has been announced by the Berst-Forster-Dixfield Company, manufacturer of wood and paper specialties, with principal offices in New York City.

The Algonquin property consists of a groundwood mill with a daily capacity of 110 tons, and a sulphite mill rated at 100 tons per day. These facilities have not been in operation for several months, but B-F-D Company expects to resume the manufacture of pulp at Ogdensburg as soon as an adequate supply of wood is available there.

Immediate plans call for utilizing the supply of wood pulp from the Ogdensburg mill at B-F-D's Plattsburg (N. Y.) paper mill. Eventually, the company intends to install at Ogdensburg papermaking and paper converting equipment to a degree that will make the newly acquired property an integrated producing unit for household paper items distributed by the Diamond Match Company. This production will be in addition to the output of the Plattsburg mill, which is and will continue to be sold to its trade by Diamond Match Company.

PAPER · · · America's 6th Industry

PAPER ASSURES SMOOTH SURFACE

(NEWS ITEM: *Smooth table tops for parachute folding are being made of plywood surfaced with impregnated plastic papers.*)

To assure glass-smooth surfaces and to guard against snagging the silk, table tops for parachute folding are made of plywood sheets faced on both sides with paper overlays. This high strength, resin-impregnated sulphite paper gives superior quality and durability to ordinary plywood . . . It will not splinter or swell.

Paper casings for shell containers . . . Paperboard for packaging food . . . Paper drums for inflammable liquids . . . Paperboard boxes for medical supplies . . . New uses for paper, calling for new standards of lightness and toughness; new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

The men and production facilities of the Pusey and Jones Corporation are at war—thinking and working at hitherto unheard of speeds. Our Research and Development Committee, while working on the problems of America at War, has found many practical and technical advantages that will mean more efficient Paper Making Machinery for the future.

Puseyjones engineers will welcome the opportunity to work with you in your Post-War planning. We have prepared three informative articles: "The Post-War Fourdrinier," "Development of Stream-Flow Vat System," "The Flow Spreader." Ask for reprints by name.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

PERSONNEL CHANGES EFFECTIVE IN WPB

The American Paper and Pulp Association reports that it is announced that the Conservation Division of WPB was closed as of October 31. No future plans are announced for Howard Coonley, director, but William Willets is returning to National Lead.

Harry Birt, of the Byron Weston Company, has succeeded W. H. Kenety in charge of the Fine Paper Branch of the Forest Products Bureau. Charles W. Boyce is returning temporarily to government service, having taken on new duties with the Bureau of the Census, which will take from three to four months to complete.

RECONVERSION IS THE MAIN TOPIC OF INDUSTRY-GOVERNMENT

Reconversion problems are coming more and more to the fore in Washington, with the War approaching a successful culmination, at least in the European theater. How to allow industry to return to normal operations without all of the present limitation and conservation orders is the subject of extended discussions on which neither industry nor War Production Board officials are in complete accord.

In the Government service, many leaders believe that all such orders should be immediately revoked after V-E Day, while others think there should be a gradual return to normal mill operation by revocation of individual orders as rapidly as they are no longer necessary. The same divergence is found among the industrial leaders. The Association of Pulp Consumers has gone on record with a formal request that pulp allocation be continued until there is a free and open market for purchasable pulp. The Newspaper Publishers Industry Advisory Committee has recommended that the control over newsprint be continued until the supply becomes equivalent to the amount consumed in 1941. On the other hand, however, some manufacturers believe in the immediate cancellation of all control orders as soon as victory in Europe is accomplished. Still others favor a progressive elimination of the various orders. On all sides, however, the hope is that some method will be found which will permit reconversion to normal operations with a minimum of disturbance of the industry as a whole.

Meanwhile reconversion is a problem in another field, that of paper and pulp mill machinery. There is a reported backlog of important orders for such machinery, now held back by lack of sufficient steel and other essential metals. At a meeting of the Pulp and Machinery Industry Advisory Committee at Washington this problem was discussed in detail, and the question of the continuance of WPB control was one of the subjects under consideration. Allan Hyer, of the WPB, was the presiding officer, and he stated that the demand for paper mill machinery after X-Day will be tremendous. While the shortage of paper and paperboard will continue after the fall of Germany, new machinery will be necessary to produce the estimated 20,000,000 tons per year which will be needed for military and essential civilian uses. It is estimated that the machinery industry will be called upon to produce far more than its present high rate of output to enable mills to manufacture the paper and board required. This condition is expected to last five years. The committee recommended that modified control of machinery production be continued for a limited period during the reconversion era.

WPB ASKED TO CONTINUE WOOD PULP ALLOCATION

Dwight L. Stocker, president of the Association of Pulp Consumers, Inc., has addressed a letter to Harold Boeschenstein, director of the War Production Board's Forest Products Bureau, requesting and urging the continuation of General Preference Order M-93, under which wood pulp is allocated, after V-E Day and until such time as reasonable inventories of wood pulp have been restored and sufficient market wood pulp is available to insure an adequate supply and a free and open market for wood pulp. The Association has recommended that during the period between V-E Day and the final revocation of the order that the controls be gradually relaxed, approximately in reverse of the order they became effective. This request of the Association was made following a series of Regional Meetings in Holyoke, Massachusetts; Syracuse, New York; Philadelphia, Pennsylvania; Neenah, Wisconsin; Kalamazoo, Michigan; and Middletown, Ohio, between September 26 and October 5, 1944, which were attended by 168 executives of the 278 mills which are members of the Association.

The Association of Pulp Consumers, Inc., is one of the largest in the paper and paperboard field. With the exception of approximately sixty firms, its membership includes all of the paper and paperboard mills in the United States which purchase 50 per cent or more of their wood pulp requirements. A large percentage of the sixty mills which are not members use very little wood pulp.

◆

CANADIAN INDUSTRY TO HAVE JOINT BOARD

Formation of a joint executive board which will serve when required as the representative body of the Canadian pulp and paper industry in matters common to the two established trade associations in that field, has been announced by Canadian Pulp and Paper Association and Newsprint Association of Canada.

The new board will have Charles Vining of Newsprint Association as chairman, and E. Howard Smith, of Canadian Pulp and Paper Association as vice chairman, with membership representing the two associations equally.

◆

▶▶▶ A GRANT OF $3,300 has been given to the University of Wisconsin by the Rhinelander Paper Company, Rhinelander, Wisconsin, for the establishment of an industrial fellowship in the departments of biochemistry and agricultural bacteriology. The grant is for the purpose of providing for the study of the fermentation of waste sulphite liquor from paper mills to determine the possibility of its profitable use in the manufacture of lactic acid, butyl alcohol, or other usual chemicals.

◆

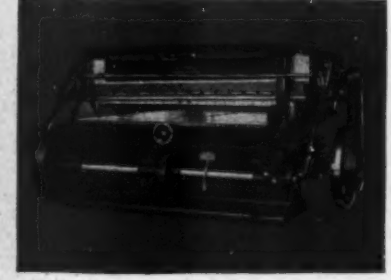
▶▶▶ DUE TO THE LIFTING of power restrictions, the Thorold (Ontario) plant of the Ontario Paper Company, closed for months under the pooling arrangements, should be in full operation by early in the next year. It is expected that production of the second unit will be started before the end of the year, and that the third unit will be started up shortly after. It is not known now how soon Beaver Wood Fiber Company, also of Thorold, will be able to resume operations.

The SEYBOLDS are coming!

Before *long* you will be able to get a new SEYBOLD again. How long is *long* is best explained by the statement we made last month —"we're getting ready . . . to begin . . . to start . . . to commence" . . . in a limited sort of way. At any rate, you'll be glad to know *you can put in a reservation now for a new SEYBOLD.* Use the attached coupon or write.

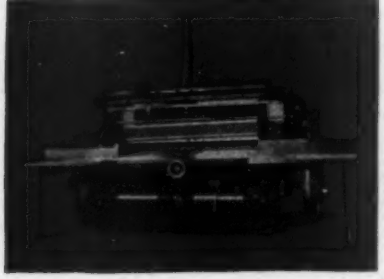
CUTTER

I'm the precision machine
Of massive design.
For accuracy—tops!
For speed—super fine!



SPACER

For making a series
Of accurate cuts
I'm a time-saving guy
With plenty of guts!



GRINDER

Keen, true edges
That's my trade
With minimum waste
On any straight blade!

SEYBOLD
• DIVISION •

Harris-Seybold-Potter Co., 823 Washington St., Dayton F-7, Ohio

SEYBOLD SALES AND SERVICE
New York: E. P. Lawson & Co., Inc., 426 West 33rd Street
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Canadian Distributors:
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You can Reserve a Seybold NOW

HARRIS-SEYBOLD-POTTER CO.
819 Washington St., Dayton F-7, Ohio.

Please send us your Purchase Proposal form which gives complete details of your Reserve Order plan.

Date.....

Name.....

Address.....

City.....*State*.....

▶▶▶ A UNITED STATES company is said to be investigating the freehold limits along the Peribonka River, with a view to purchasing this property from the Quebec Pulp and Paper Company, of Chicoutimi, Quebec. This company was placed in bankruptcy in October, 1942, and the Quebec Government claims $1,824,000. The timber limits controlled by the company contained some five million cords at the time the company was placed in bankruptcy, and its groundwood pulp mill at Chicoutimi has a capacity of 300 tons per day. Power sites developed are good for 36,000 horsepower.

◆

▶▶▶ REMOVAL OF OFFICES of Industrias Klabin Do Parana, New York, has been announced as of October 1. The new address is the Empire State Building, New York 1, New York. Phone, Pennsylvania 6-1746.

◆

FINANCIAL

A flurry in the securities markets the latter part of October setting off a decline in values had little effect on paper mill securities. On the contrary, paperboard company securities showed some strength as compared with prices at the end of September. A notable price change involves Certain-teed Products Preferred, which, selling at about 106 in late September, has now advanced to prices ranging nearly to 125.

Albemarle Paper Manufacturing Company—Net profit for the quarter ending June 30 was $57,753 as against a loss of $6,262 for the same period in 1943.

A.P.W. Paper Company—Net income for the fiscal year ending June 30 was $78,282 as against $23,736 for the previous year.

Celotex Corporation—Net profit for the third quarter of the fiscal year ending July 31 was $85,476; for the six months period, $209,093; and for the nine months of the year to that date, $294,569.

Champion Paper and Fibre Company—Net profit for sixteen weeks ending August 20 was $611,435 as against $664,334 for the comparable period in 1943.

Robert Gair Company—Net income for nine months ending September 30 was $519,978 as against $652,353 for the same period in 1943.

Kimberly-Clark Corporation—An issue of 4½% cumulative preferred stock will be issued to replace outstanding 6% preferred, and there will be an additional issue of common stock, present common stockholders being given the right to subscribe for the new stock on the basis of one share for each five now held, before a public offering of the new securities.

Mosinee Paper Mills Company—Net profit for the fiscal year ending May 31 was $184,507 as against $176,575 for the previous year.

Union Bag and Paper Corporation—Net income for the quarter ending September 30 was $456,193, as against $406,464 for the same quarter in 1943. For the first nine months of this year, net was $1,251,547, as against $670,753 for the previous year.

S. D. Warren Company—A first mortgage bond issue of $4,500,000 has been authorized, with a probable interest rate of 4%. The funds will be used to retire present 4½% and 4¼% securities to a total of over $4,000,000.

New York Stock Exchange—Stocks

	Closing Prices Oct. 25	Sept. 25
A.P.W. Paper Co.	3¾	4⅛
Celotex	13¾	14
Same Preferred	18	18¾
Certain-teed Products	7½	6½
Same Preferred	124¾	106
Champion P & F Co.	29	28
Same Preferred	*113–113¾	*111½–113
Container Corp.	28⅜	26¼
Cont. Diamond	10¾	10⅞
Crown Zellerbach	20¼	19¼
Same Preferred	102⅛	*102–102⅜
Dixie Vortex	*18⅛–18⅜	*20⅛–20⅜
Same "A"	47¼–47⅜	47
Robert Gair	4⅜	4⅜
Same Preferred	*15½–15¾	15¼
Gaylord Container	20	20⅜
Same Preferred	*54⅛–55½	*53½–54
International Paper	19⅜	19½
Same Preferred	88	83
Kimberly-Clark	36½	*38–40
McAndrews & Forbes	*29½–29⅝	*29½–30
Masonite	41½	43¾
Mead Corp.	11⅜	12
Same Preferred	*99–100	*97–99
National Container	11⅜	10⅝
Paraffine Cos.	56¾	53
Same Preferred	106⅛	*105–110
Rayonier	16	17⅜
Same Preferred	33⅞	*31¾–32¼
Scott Paper	*43–44	*42¼–42⅞
Same 4½% Pref.	113	*112½–113
Same 4% Pref.	*107½–109	*108–109
Sutherland Paper	*30–31¾	30
Union Bag & Paper	13½	13⅞
U.S. Gypsum	78	78½
Same Preferred	*175½–180	*175–179⅞
West Va. P & P Co.	23¾	24½
Same Pref.	*107¼–108¼	*107–108¼

New York Stock Exchange—Bonds

Abitibi 5%	.....	89
Celotex 3¾%	104	.....
Certain-teed 5½%	102	101¾
Champion P & F Co.	.....	.....
Internat'l Paper 5%	103½	.....
Same 6%	108¾	.....
West Va. P & P Co.	.....	.....

New York Curb Exchange—Stocks

Am. Boxboard	.....	.....
Great Northern	36½	35⅜
Hummel Ross	7¼	7¾
St. Regis	5⅜	6
Taggart	.....	.....
United Wall Paper	4½	4¾

*Closing Bid and Asked Prices.

▶▶▶ NATIONAL SELECTIVE SERVICE and provincial labor officials across Canada are cooperating to repeat last autumn's mass transfer from farms to forests, base metals and coal mines, railway maintenance, construction, flour and feed milling, meat packing, foundries, heaving ammunition and shell filling. Objective is 100,000 men of which perhaps 60 per cent will be asked to engage in forest operations.

◆

CONFERENCE ON WOOD PRODUCTS DEVELOPMENT AT FORESTRY COLLEGE

At the conference on New Developments in Wood Products held at the New York State College of Forestry, Syracuse, New York, those present glimpsed a most promising future. The conference indicated a strong trend in forestry toward utilization. There was an extensive exhibit of paper products and articles in the field of plastics, as well as lumber and miscellaneous materials.

The conference was held through two days—October 6 and 7—and the program of the sessions included addresses by a number of prominent men. Among the speakers was Dr. Edwin C. Jahn, of the staff of the New York State College of Forestry, who has just returned from Sweden and England. Dr. Joseph S. Illick, acting dean of the College, spoke at the banquet which followed the first day's session. His subject was "Looking Forward in Forest Education." Some highlights of his address follow:

"Everyone who is in close touch with forest education knows that its scope is much wider today than it was in 1898 when professional training in forestry began in this country. As a result of the widening of this scope, the more progressive and comprehensive forest curriculum now includes courses in aerial mapping, wildlife management, recreational land use, camp administration, forest structures and improvements, forest accounts and records, lumber salesmanship, wood preservation, dry kiln engineering, wood chemistry, cellulose chemistry, cellulose technology, and wood plastics.

"The largest single group of new subjects now awaiting admission to the curricula of our American forestry schools relates to new developments in the field of wood products, that is courses covering the kind of information being considered in the program of this conference.

"There is general agreement among forest educators that the present training period of most forestry schools is

PAPER

17 million tons* of it!

GENERAL CHEMICAL COMPANY ***products for the Paper Industry:***

Aluminum Sulfate (*Standard and Iron Free*) • **Sodium Silicate**
Zinc Chloride Solution • **Glauber's Salt** (*Crystal or Anhydrous*)
Sodium Sulfide • **Sodium Bisulfite** (*Solution or Anhydrous*)
Crystal Alum, Potassium • **Salt Cake** • **Trisodium Phosphate**
Sodium Metasilicate • **Sodium Hyposulfite** • **Muriatic Acid**
Sodium Sulfite Anhydrous • **Sodium Aluminum Sulfate**
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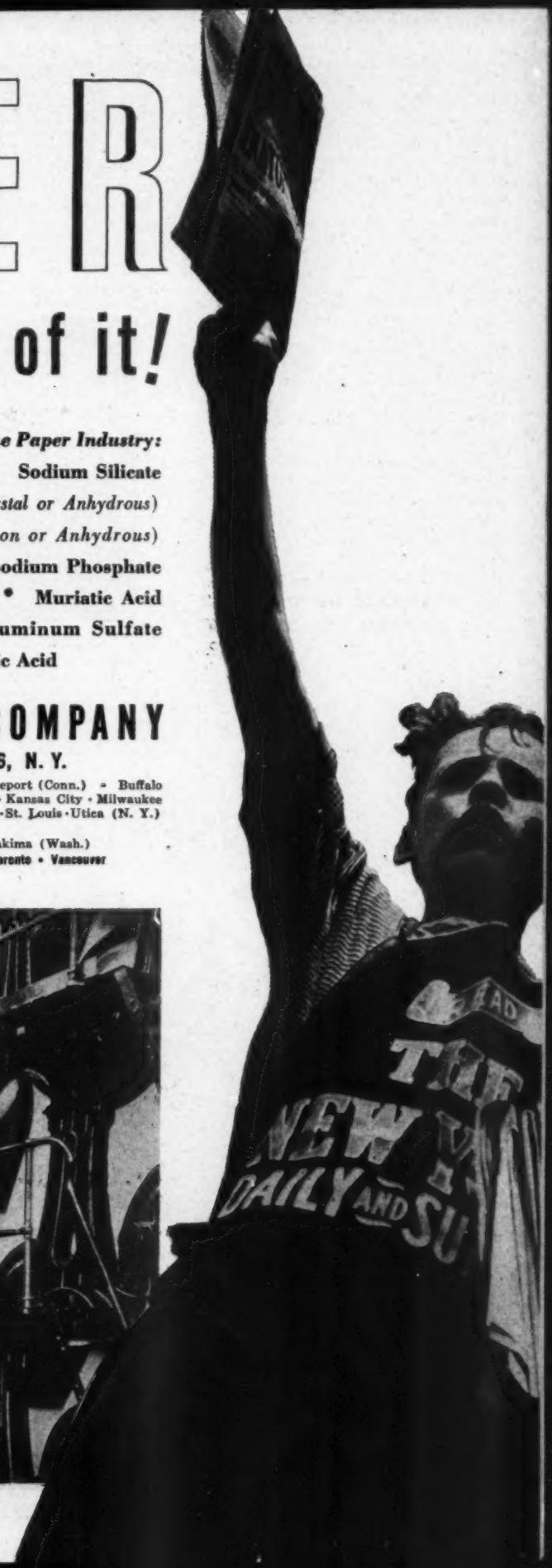

*Estimated American Paper Production for 1943

too short and that before long it will not be possible to complete the professional training in forestry in four years of undergraduate work."

In concluding his address, the Dean said: "Occasionally we hear that wood is on its way out. I know of nothing in forestry that is farther from the truth. For every wooden product that has gone out of use, several new ones have come in, and highly significant is the fact that enormous quantities of wood are being used in so many different products and for so many different purposes in which its use is not obvious. Wood will continue to be among the most essential materials in our future economy, and so that it may give its highest services to the American public it is our responsibility to plan and provide for an abundant measure of high quality forest education and forest research."

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POSTWAR PLANNING IS THEME OF CENTRAL PAPER CO. MEETING

Sales representatives of Central Paper Company met in conference at the general offices of the company in Muskegon, Michigan, the week of September 17. Throughout the conference there was special emphasis on postwar planning. Considering the rapid advancement of paper treatments and usages during the War, and the possibilities for paper in postwar work, the company considers this gathering one of the most important in its history.

Special attention was given to plans for converting war-born papers to peacetime applications in three-way conferences between sales representatives, laboratory technicians, and production heads. Future sales and merchandising plans were discussed and the company's 1945 advertising program was outlined. Charles W. Smith, president and general manager, presided at the meetings. This was the first sales conference to be held in the company's new modern offices.

At the general sales meeting of the Central Paper Company, Muskegon, Michigan, were: Seated—(L to R) J. E. Wilson, Buffalo; G. Westerberg, manager New York office; H. E. Bouis, St. Louis; H. C. Engel, manager Chicago office; C. W. Smith, president and general manager of the company; Edgar A. Hall, Jr., Cincinnati; F. C. Vogel, manager Detroit office; A. D. Keillor, Detroit; F. J. Ford Blickley, Detroit; John Shay, manager Boston office. Standing—W. H. Erickson, Chicago; D. H. Strickland, sales supervisor, general offices; Ray Terrien, senior sales supervisor, general offices; W. H. Cochran, Baltimore; L. J. Walker, Chicago; and L. Powers, New York.

CONSERVE The CUTTING STEEL
On Your Paper Knives

Actually, that narrow strip of extremely tough steel —the cutting edge of your paper knives—takes all the beating. And in bringing dull knives back to proper condition, it is this costly band of metal that is ground away. Makeshift sharpening methods or obsolete equipment help to multiply the loss—hand methods are slow and inaccurate.

The new Covel-Hanchett GK Knife Grinder speeds up knife sharpening, assures an accurately straight, even edge on any knife. Fully automatic, the GK needs no skilled operator—once the knife is positioned and the controls set, this man is freed for other work. And the extra-heavy cabinet base construction affords a solid, vibration-proof machine that will stand up under the toughest schedules.

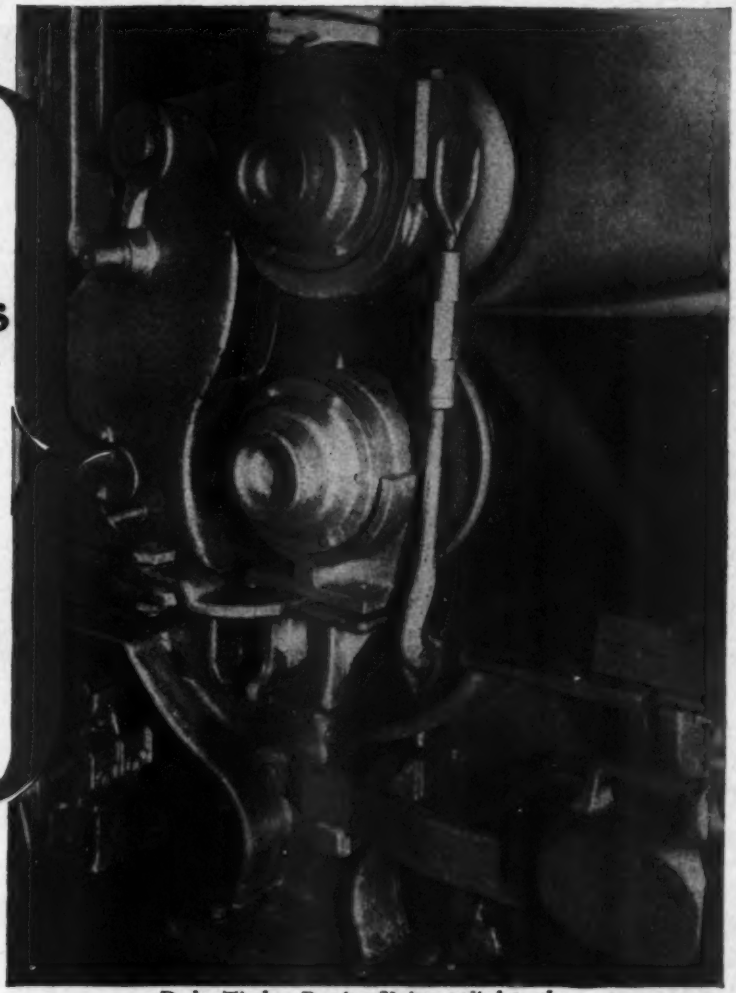
Let Covel-Hanchett engineers show you how the GK can reduce maintenance costs, save valuable knife steel and keep those cutting blades in perfect condition for precision work at all times. Write today!

★ SAW SHARPENERS
★ SAW STRETCHERS
★ KNIFE GRINDERS
★ SWAGES AND SHAPERS
★ WELDING CLAMPS

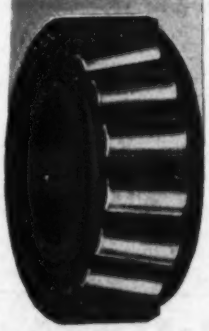
COVEL-HANCHETT CO.
BIG RAPIDS, MICHIGAN PORTLAND, OREGON

★ ELECTRIC BRAZERS
★ ANVILS AND HAMMERS
★ BAND WHEEL GRINDERS
★ MISCELLANEOUS SAW & KNIFE FITTING EQUIPMENT

to raise the performance standards of your paper-making machines



Dodge-Timken Bearing Units applied to the primary press rolls of board machine.



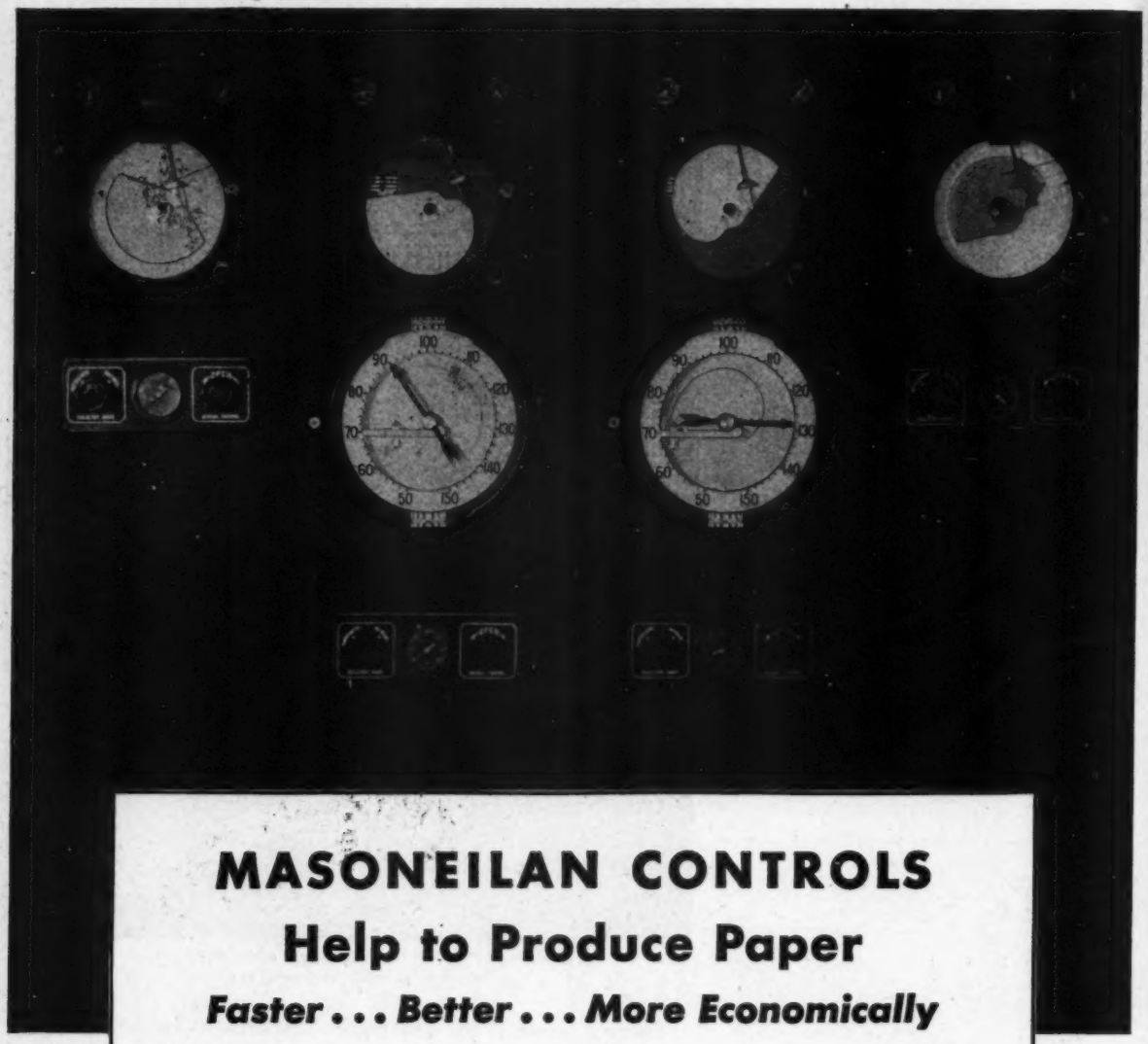
TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

There's no need for any paper machine to be *obsolete* as far as performance goes, no matter how *old* it may be.

It's surprising how great an improvement even a few Timken Tapered Roller Bearings make in machine operation through reduction of friction and wear; control of radial, thrust and combined loads; and prevention of misalignment.

Most existing paper machines can be modernized by the replacement of friction bearings with Timken Bearings, thereby removing speed restrictions and other operating handicaps; increasing accuracy; reducing maintenance and extending equipment life.

Prepare your equipment to meet post-war competition by applying Timken Bearings at every possible position. Consult the machine builder or our engineers. The Timken Roller Bearing Company, Canton 6, Ohio.



MASONEILAN CONTROLS
Help to Produce Paper
Faster . . . Better . . . More Economically

Today, when time is precious and paper scarce, Masoneilan control equipment is helping paper makers get out paper fast.

Simple, accurate, sensitive, these controls give operators complete control over every process thereby enabling them to produce better quality paper with little if any rejects. And because all Masoneilan controls, such as regulators, indicators, recorders, complete digestor controls, etc., are constructed to give dependable service year after year, they increase production by reducing time out for maintenance.

It will pay you to investigate Masoneilan Control Equipment for your plant . . . *when war is won.*

For Victory — Keep Buying Bonds

MASON-NEILAN REGULATOR COMPANY
1196 ADAMS STREET, BOSTON 24, MASS.

MASONEILAN

New York • Philadelphia • Pittsburgh • Toledo
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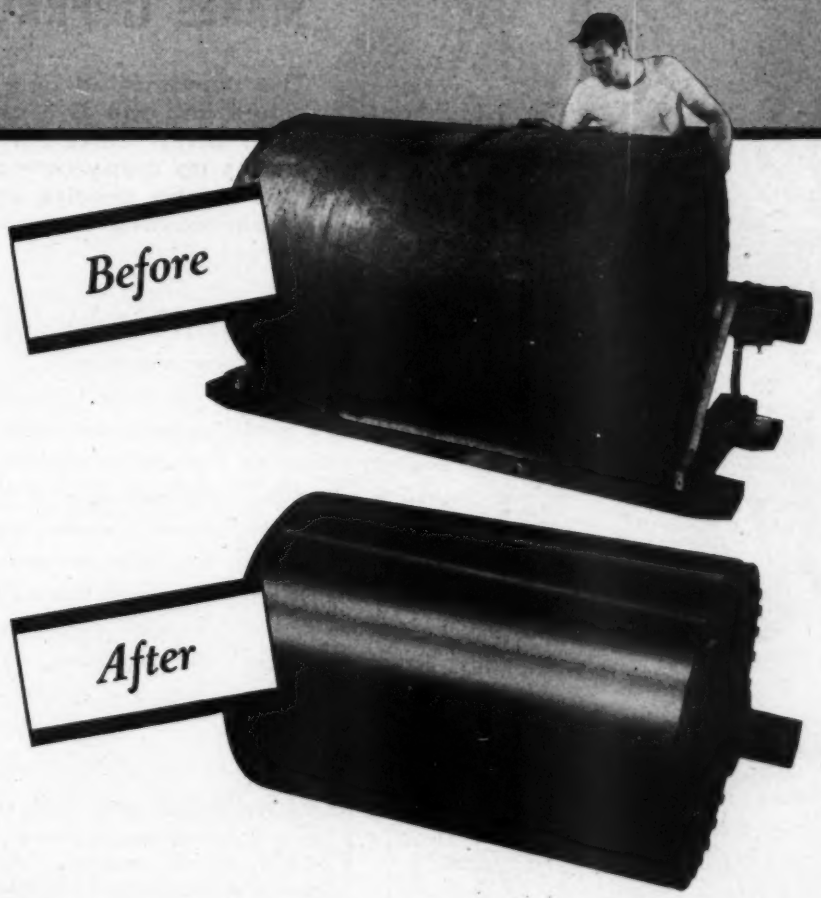
Los Angeles • San Francisco
Mason Regulator Co. of Canada, Ltd., Montreal, Canada

SAVE YOUR OLD ROLLS WITH

WELDCO COVERS

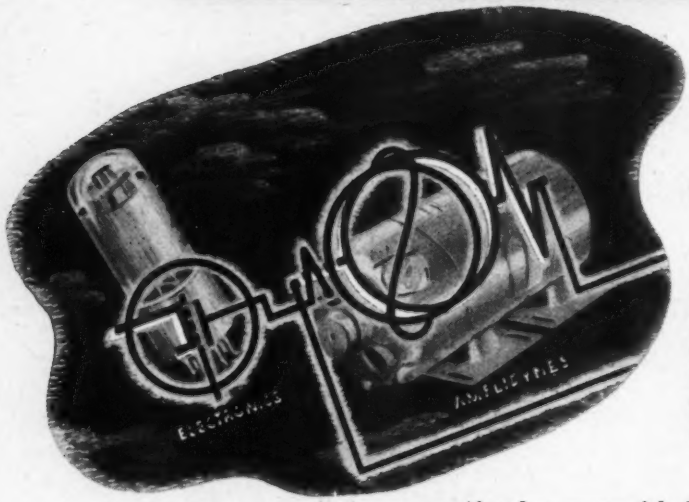


● By covering the cast iron, brass, and bronze cores of your worn-out rolls, you save the cost of expensive new cores. Weldco roll covers of Monel, Inconel, Nickel, and Stainless Steel give you other savings, too. The new Weldco covers will resist corrosion and withstand abrasion, thus decreasing the frequency of grinding and polishing. These tight-fit covers with beautiful uniform surfaces are giving years of trouble-free service on all types of paper mill equipment. Youngstown Welding's engineers have made many cost-saving recommendations to paper mills. Write today and let them analyze your requirements . . . to save you money and to increase your quality production.

THE YOUNGSTOWN WELDING AND ENGINEERING CO.

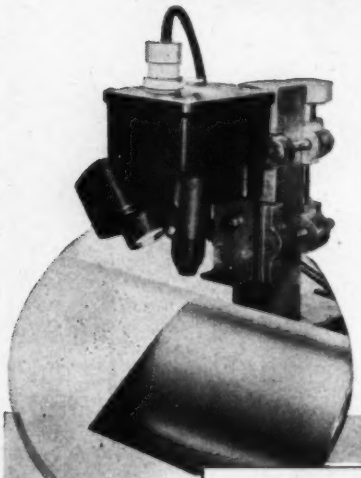
3752 OAKWOOD AVE. YOUNGSTOWN 9, OHIO

How HAIRLINE Control



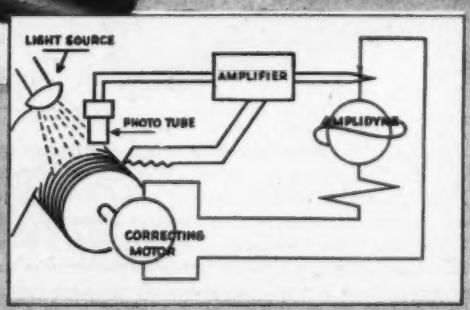
This G-E PARTNERSHIP MAKES IT PRACTICAL

The combination of electronic tubes and the G-E amplidyne (and often electronics alone) opens up many new possibilities in the precise control of paper travel over a wide range of speeds.



Already, successful installations are controlling side register and cut-off, regulating speed of supercalenders, and maintaining constant tension on rewinders as well as on sectional and single-motor paper machines. On bag machines, cut-off control at speeds of 400 to 500 ft per min is being held to an accuracy of 1/32 inch or better. Color register on high-speed presses is being held to 3/1000 inch at 1000-ft-per-min speeds!

With the G-E amplidyne, response to the control impulse is fast and positive. This generator-like unit steps up small control signals to working forces that can handle heavy machinery without appreciable time lag. By eliminating many contactors and relays, the amplidyne gives you a new concept of operating simplicity.



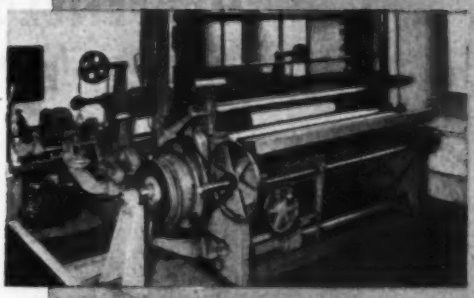
MAINTAINING SIDE REGISTER: Where accurate positioning is required, G-E photoelectric control equipment (left) scans the moving paper and detects variations in register by differences in reflected light. Electronically amplified, this control impulse acts through a G-E amplidyne to provide the corrective motive power. This is only one of the many ways in which these versatile units hold operations to the desired position, torque, or tension—regardless of speed.

GENERAL ELECTRIC

Of Paper Travel

FOR WINDERS, SLITTERS

Accurate side register control as paper travels at high speed is initiated by a photoelectric scanning head at the edge of the sheet (shown just below counterweight). An amplidyne powers the motor which corrects the roll position.



G-E side-register control on Cameron Machine Co. paper winder and slitter

FOR COLOR REGISTER

Here's extreme accuracy of register at high speed—a multicolor rotogravure press with paper speed of 1000 ft per min! A register mark made by the first impression is photoelectrically matched with a register slit on the next printing cylinder.

Installation at Nap Gravure Co., New York City.

FOR BAG-MAKING MACHINES

Web-register control for precise cut-off begins with photoelectric scanning of register marks. An amplidyne-powered motor applies a differential correction between draw-roll speed and knife-roll speed.

Installations at Arkell and Smiths, Conshohocken, N. Y.

OR WHAT-HAVE-YOU?

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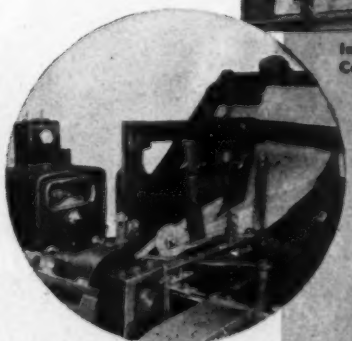

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. . . Editorial . . .

Ring the Liberty Bell on V-Day

▶▶▶ IS THERE ANY red-blooded American who wouldn't like to hear the pealing of the Liberty Bell? No — there couldn't be.

Travelers to Philadelphia, no matter from whence they come, are led to this shrine of early American history. They stand before it in reverence and awe and leave with an inner feeling that right will prevail in the world.

W. J. Conley, consulting welding engineer, The Lincoln Electric Company, after studying the bell, reports that it is both practical and safe to repair the crack in its side — that it can be repaired so that the full tone of the bell will be restored.

Mr. Conley, as authorized spokesman in the matter for his company, has recommended to the Seventy-Eighth Congress of the United States to appoint a committee of experts to decide on the exact procedure to be followed in making the repair — he even proposes a definite technique for doing the job — and to take appropriate action to repair it so that it can be rung on V-Day. On that day and in the days to follow, states Mr. Conley, let the symbol of Liberty be heard by the miracle of radio across the land and around the world.

Why not take up the cudgel of Mr. Conley. Write to the Honorable Sam Rayburn, Speaker of the House of Representatives, Washington, D. C., who already has been made acquainted with Mr. Conley's proposal, and request prompt action on the matter.

To refresh your memory, here are a few important facts regarding the bell.

The bell arrived in Philadelphia from England, where it was cast, toward the end of August, 1752, for installation in the State House. The very next month, it was cracked by a stroke of the clapper. Thereupon, it was recast twice by Pass and Stow of Philadelphia, the first recasting being unsatisfactory. It was rehung in the State House following the second recasting, in June, 1753, and has remained in that building (now Independence Hall) except for a few comparatively short intervals ever since, once during the British occupation of Philadelphia, and then for exhibition purposes on several occasions.

The bell was rung for the first time on August 27, 1753, and that ringing was for the purpose of calling the Assembly together.

It was on July 8, 1776, that it was rung to inform the populace concerning the proclamation declaring our independence.

A few other occasions upon which the bell was rung are: September 29, 1824, as a welcome to Lafayette to Philadelphia; July 4, 1826, on the fiftieth anniversary of the Republic; July 24, 1826, in commemoration of the death of Thomas Jefferson; February 22, 1832, in commemoration of the birth of George Washington (the last recorded ringing for this purpose); July 21, 1834 — Lafayette was dead; and July 8, 1835, in honor of John Marshall who had died on July 6th and whose remains that day were being taken to Virginia for burial.

While tolling slowly for the funeral solemnities of Mr. Marshall, the bell cracked again, 59 years to a day from the date of its memorable ringing to proclaim our Declaration of Independence.

Remaining in this condition down through the years, the bell was struck lightly on April 6, 1917, by city officials of Philadelphia to proclaim that a state of war existed between the United States and Germany.

What would be more fitting than to ring it once more in all its fullness of tone, broadcasting the sound to the entire world, when Germany collapses again and World War II, at least in the European theatre of operations is brought to a close. Would not such a ringing fulfill again the inscription that encircles the crown of the bell — PROCLAIM LIBERTY THROUGHOUT ALL THE LAND UNTO ALL THE INHABITANTS THEREOF LEV. XXV, X.

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Who Knows?

▶▶▶ THE UNSOLVED QUESTION still persists.

"What of the paper demand and supply in the postwar period?" We don't know and so far we can't find anybody who does know.

There have been attempts made to answer the question, but as we have gone over these theses, they are either too limited or too confused. In the absence of any authoritative pulp and paper statistics compiled from actual surveys and prime fact-finding research, no conclusions of any worth are at present available.

What we should have today in the hands of every pulp and paper mill operator, is a factual, comprehensive, authoritative analysis of just what the demand and supply situation in this country is for every grade of paper used. Together with that, we should have an equally reliable factual survey of the Scandinavian pulp and paper production outlook. Also a survey of the demand for paper in the global rehabilitation era.

This much is certain: That when hostilities cease, North America will be the only active paper producing area on the globe, except Sweden. The world will come to North America for its pulp and paper tonnage. We do know — or should know — just what our facilities will be for supplying the pent-up demand of three years' accumulation in this country, and the seven years of pent-up demand from the world at large.

Toumey has said that "Victory comes with the greatest iron mines and smelters, the largest areas of waving grain, and the greatest abundance of wood." If a nation would win its wars — or what is more important — be influential in the fight for peace, that nation must make provision for perpetually productive forests from which adequate supplies of wood can be obtained to meet its need in peace as well as in war. We have the facts on steel and waving grain. Where are the facts on wood?

We do know the world will turn to America for its finished products of lumber and paper, and in all probability for the raw material — wood and pulp — from which to fabricate all its commodities which require wood as its basic raw material.

Can our forests, which as long ago as 1919 were being cut down in excess of their natural growth by more than four billion cubic feet a year, stand the drain of a world-wide demand for lumber, pulp and paper? Who knows? The facts are obtainable. Who should gather and distribute them other than the paper industry?

What is the paper industry doing about it?

Current Thought

WILLIAM KRUEGER

Observations on This and That

▶▶▶ IT IS AMAZING, sometimes, where one finds keen vision—and, likewise, the lack of it. 'Way back in 1914, when the airplane wasn't much to speak of, the late Adm. Robert E. Peary, looking upon the crude craft, foresaw great future for the implement of travel. He prophesied ocean crossings and transcontinental flights. Even then he urged a coastal defense which, in 1942 when the submarine menace in the Atlantic became so serious, was followed almost to the letter. He suggested a continuous picket line of airplanes just offshore, saying prophetically: "Seaplanes and small dirigibles will constitute an air power which can combat the submarine menace better than any other agency."

In consideration of this same distance-shortening, time-quickening instrument, Thomas A. Edison wasn't so sanguine. Of course, he was thinking only in terms of dirigibles, but for them he could see very little future. The *New York Herald* of April 14, 1902, for instance, carries an interview with Santos Dumont, the South American aviation enthusiast who had been flying hither and yon in a dirigible of his own design. Mr. Dumont had talked with Mr. Edison about his invention, and later described the interview by saying: "Mr. Edison told me that while he thought flying machines could be made to travel considerable distance, he could not see any commercial value in them. He also said that he did not care to spend time on an invention that was not of commercial value."

◆

▶▶▶ AND SPEAKING OF RAILROADS—they had best look not to their accommodations and speed, but to their fares as well. Not long ago I had occasion to go from Chicago to Los Angeles, in a hurry. (Who isn't in a hurry, these days?) At any rate, without benefit of priority, I took a chance on TWA. I got as far as Kansas City, and was "bumped" for priority passengers. Being human, I griped some, but inwardly realized that during these war days, such "priority removals" were a necessity. I stuck around the Kansas City airdrome for six hours (a very boring place at 2 A. M.) until finally, at 8:30 A. M. I got on a plane whose flight originated in Kansas City. It was filled with nonpriority passengers. As it turned out, I was indeed fortunate to have been bumped in Kansas City because that gave me a daylight ride all the way through—putting me about 2,000 or 3,000 feet above that indescribable area which constitutes the Grand Canyon. And mister—you may have *stood* on the brink of that little ditch and been overawed at its size and grandeur—but you haven't seen anything until you have *flown* over that area which is some 40 miles wide and 96 miles long. It is a place where adjectives don't work, and also a hell of a place to run out of gas! We dropped into the Lockheed airport at Burbank at 4 P. M. Cost, including limousine fare at each end $117.00. . . . . Even with the "bump" of 6 hours; time 18 hours.

Returning to Chicago I couldn't get on a plane, so (very fortunately) got a roomette on the Super-Chief. Fare: $130.79—and pay for your meals (such as they were) in the diner. Time: 42 hours.

Look, Mister Railroad Devotee—there's a severe discrepancy here. Of course, the Super-Chief is a $15 surcharge train. But, by the same token, $15.00 of the $117 for air travel was federal tax. The roomette cost dough, sure—but the air accommodations were comparable. On the train I had to buy my food in a diner which sounded as if they were serving a convention of Swiss bell-ringers. On the plane, the stewardess served good meals, gratis. Come, come Railroads—you gotta do better than that.

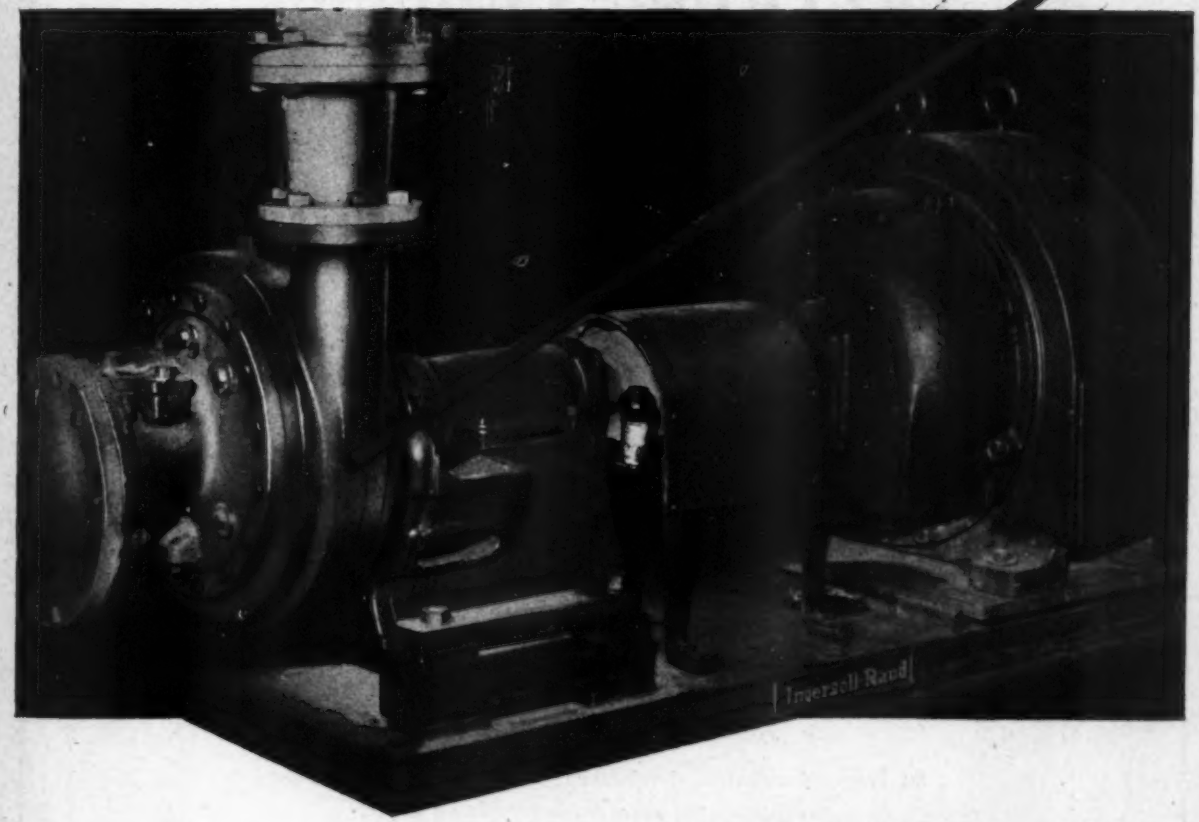
▶▶▶ HAVE YOU TRIED to travel recently? Well—don't! it is a real trial; a lot of hard work; an annoying adventure.

Even on crack trains such as the Super-Chief, the Century, the City of San Francisco, the Floridian, accommodations are jammed, and frequently the dining car service is so out of joint that you will be much better off to carry a hamper of food with you. I mention trains exclusively, because automobiles are largely without gas or tires, while airplanes are preemptied by priorities. .

But don't expect travel conditions to adjust themselves to "normal" the day after the Armistice has been signed. The inalienable right of the American citizen to go places and see things will rise to the surface with a surge when peace comes, and right now rail, steamship, and air lines are busy preparing for a tremendous pick-up in travel, once they have redistributed the armed forces and their facilities are again open to the public. As this is being written, a lot of postwar problems in air travel are being taken up for discussion and straightening. Whether it will result in a better agreement than Dumbarton Oaks, remains to be seen.

In the meantime, air lines are, as you know, ordering large numbers of new passenger planes, many of which will have fancy appointments now unknown. Railroads have assigned commitments for large numbers of flossy, stainless-steel or aluminum trains, with coaches, lounge cars and diners fancier and more comfortable than ever before . . . . And all the while there are the owners of some forty or fifty million automobiles, trucks, tractors, and airplanes just biting their fingernails waiting for the day when they can drive into the filling station and pre-emptorially order the pump attendant to "Fill 'er up!" Yes—the American public is going to travel—if it has to run on the rims or stand in the aisles.

NO VACATIONS FOR PAPER-MILL PUMPS



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RYERTEX *Water-Lubricated* BEARINGS

Some Practical Suggestions for the Sulphate Cook

W. W. HENDERSON

▶▶▶ IN MANUFACTURING PULP by the chemical processes, the digester foreman, usually called the cook, should keep in mind the purpose of the digesting or cooking process. In southern woods particularly, the composition of the wood is roughly 50 per cent cellulose and the balance water, lignin, sugars and other carbohydrates, resin proteins, fats, and minerals, all having a direct bearing on the manufacture of pulp. Since the cellulose only can be used for pulp, the other components must be removed.

Therefore, the purpose of cooking the wood chips is to bring about complete separation of the cellulose from the noncellulose content. In the sulphate process this separation is accomplished by steaming the chips in an alkaline solution.

In starting up a new mill, the first charge of cooking liquor is usually made by dissolving soda ash (58 per cent sodium oxide—Na_2O) in water until the resulting liquor tests 18 deg. to 20 deg. Bé at 60 Fahr. Please note that although soda ash is sodium carbonate (Na_2CO_3) its purity is stated as being equivalent to a certain percentage of Na_2O. Thus soda ash (58 per cent Na_2O) really means the soda ash is 97.5 per cent Na_2CO_3.

The first cooks made with this liquor produces soda pulp, and sulphate pulp can only be made after reclaiming the spent cooking liquor by evaporation of excess moisture, reduction of the sodium sulphate in the smelters to sodium sulphide, and then causticizing with lime, which produces the necessary sulphate cooking liquor — white liquor. This procedure means that considerable low grade pulp is produced before sulphate liquor circulation becomes balanced ahead of the digesters.

Modern procedure eliminates the soda pulp, entirely by adding flake sodium sulphide to the soda ash liquor, and causticizing the mixture with lime, thus the very first cook produces sulphate pulp. There have been arguments pro and con on the additional cost of starting up with sodium sulphide, but the author's experience has been that while the initial fifteen or twenty cooks may cost more, money and time is saved, and there is no low grade pulp to be disposed of at a loss. The spent liquors from these cooks are put through the usual recovery process for reuse.

Since stationary digesters are the most common type used in the South, they are referred to here in all discussions. Every cook knows they are, by far, the simplest type to operate. The sizes vary from four to ten tons capacity of air dry pulp, with six to slightly over eight tons capacity predominating.

Quality pulp is, of course, the cook's aim, and it must be obtained in such a manner that the maximum yield is produced per cord of wood used with a minimum chemical cost. Other important points are (a) clean blowing, which means careful filling of digesters; (b) an easy washing pulp or entire operating cycle can be upset; (c) keeping the drying machines, paper machines or bleach plant supplied with sufficient pulp for maximum production; and (d) accomplish all the above within the desired cycle and with minimum steam and liquor losses.

The cook must not only know the kind of wood he is cooking, but its age, how well it is barked, and the amount of moisture it contains so the active alkali content, on a dry wood basis, can be calculated and maintained at the most favorable quantity for efficient operation. This information can be obtained by careful sampling and testing of the chips entering the digester, and making a moisture check on them by drying in an oven to bone dryness.

Filling the digester is being done in several different ways in the South. Sometimes the liquor is started first and a minute or so later, the chips; then both continue together until the digester is full — and then steam turned on after the digester cover is in place. Another method is liquor first and chips a minute or so later, cracking the steam valve very lightly to help settle the chips. This practice is dangerous from the standpoint of steam burns to operators unless very carefully handled. Again the chips may be loaded first, starting the liquor after the bottom cone is full and continuing liquor and chips together and steaming after the cover is in place. By far the most practical method, where a circulating system is not used, is to run chips and liquor in together and steam after cover is on. Where circulating is practiced, best results are obtained where chips and liquor are run in together until the digester is about four-fifths full. Then the circulating pump is started, the liquor taken from near the bottom, pumped up to a circular liquor spray near the top, and sprayed back on top of the chips, more chips being added until required amount is loaded.

After filling is complete, the top of digester is cleaned, a gasket — some-

times a wet lap of pulp, but preferably a lead gasket designed to fit grooves in the digester top and cover — put in place, and the cover bolted down. Steaming then begins.

The cook must know the strength of his cooking liquors as to caustic and sulphide content as well as the volume of liquor to be used, and of course, the steam pressure and temperature, and must keep records of the time of the six operations (filling, steaming, relieving, cooking, relieving and blowing) involved in the cooking cycle.

Some chemical terms with which the cook must be thoroughly familiar to properly digest pulp are:

Active Alkali: In the sulphate process, this means the sum of the caustic soda (NaOH) and sodium sulphide (Na_2S) expressed as Na_2O. Naturally, the quantity of active alkali will vary slightly depending on wood used, and from mill to mill. It is important to determine the correct amount for the quality and type wood being used. Too much active alkali will radically change quality of fiber and reduce yield. The most satisfactory results are obtained by using 20 to 23 per cent active alkali, based on bone dry weight of chips.

Total Active Alkali: Is the number of pounds of active alkali used per cook and is the sum of caustic soda (NaOH), sodium sulphide (Na_2S), and carbonate (Na_2CO_3) expressed as Na_2O.

Total Liquor: The volume of liquor used per cook, which varies as to type of wood and size of digester, as well as quality of pulp to be made. Scales on liquor storage tanks permit direct readings of the volume used, either in inches to be converted later, or in gallons or cubic feet, whichever is most practical for the mill in question. The important point to remember is that the correct volume of liquor to use per cook is that which has been predetermined by analysis to contain the required amount of active alkali in per cent of dry wood to satisfactorily digest the chips and occupy the desired proportion of digester space. The careful use of active alkali must prevail to make high grade uniform quality pulp, as any excess will drastically effect fiber quality.

Too much liquor volume makes relieving without pulling some liquor through impossible, thus causing loss of alkali in the particular cook being made, even if the liquor so pulled over is going back into storage.

On the other hand, too little volume means burned or uncooked fiber mixed with good fiber.

The established practice in southern mills is to make up liquor volume (adding to the white liquor used in cooking) with black liquor (liquor recovered from washing the pulp, and which contains much water before concentration by evaporation). Thus, volume can be increased or decreased at will and still maintain the correct amount of active alkali.

Steaming the digester depends entirely on the quality of pulp to be made. Some grades require quick, harsh steaming while others mean slow steaming and long cooking. In mills cooking for board pulps and certain kraft papers, thirty to forty-five minutes is required to bring the digester up to pressure (110-115 Fahr. depending on mill conditions). The pressure is then maintained for from one hour to one hour and forty-five minutes, governed by final product. In coming up to pressure, the cook watches his steam flow and temperature meters, and, to obtain good circulation of liquor and steam, manipulates the digester relief valve.

For regular kraft papers, the cooking cycle varies, but as a rule approximately one-third to one-half of the total cooking time is usd to bring the cook up to pressure and the balance in cooking at pressure.

When the digester is up to pressure, the relief valve is closed and the steam valve left open just enough to maintain cooking pressure — however, further use of the relief valve is required during cooking period to maintain proper temperature.

If the mill is using diffusers to blow into for washing, it is best to relieve shortly before the cook is complete until at blowing time the pressure is between 70 and 80 lb. depending on the equipment. If a blowpit is being used, this procedure is not necessary — blow at cooking pressure.

Temperature and Pressure: The operator should remember that saturated steam at any given pressure has a definite corresponding temperature, and in mills where digesters are not equipped with modern combination pressure and temperature recorders, the temperature can easily be determined from the pressure gauge reading. For instance, if the gauge pressure in pounds per square inch is 0 lb. with steam on, the temperature is 212 Fahr.; 100 lb. equals 337.9 Fahr.; 110 lb. equals 344.2 Fahr.; 115 lb. equals 347.2 Fahr., and so on. Therefore, where the temperature at which the cook is to be made is known, all that is really necessary for the cook to do is to watch the pressure gauge until that pressure is reached and maintain it by manipulating the relief valve.

One must be careful, however, to watch out for fictitious or gas pressure — indicated by a rapid rise in pressure without a corresponding rise in temperature. The cure for this condition lies in proper relieving of the digester until the gas escapes, and temperature and pressure again maintain corresponding levels.

Relieving is an important control step in the cooking cycle for the following reasons: (1) to maintain proper circulation of steam and liquor, especially where liquor circulation system is not used, (2) to control temperature at proper level for uniform cooking, and (3) to relieve pressure before blowing when diffusers are used. At the beginning of the cook, after cover is in place, a certain amount of air remains among the chips not covered by liquor. When steam is turned on, gases, such as turpentine, are liberated; and both air and gases must be removed by relieving in order to get proper circulation.

Temperature has a most important influence on pulp quality and should always be held at the lowest point at which the desired quality of pulp can be consistently produced. It is not possible, however, to properly disintegrate the chips and obtain a free fiber at temperatures much lower than 320 Fahr., even by increasing the alkali. Temperatures between 330 Fahr. and 350 Fahr. will do a good job with most modern mills averaging around 340 Fahr. to 345 Fahr.

In blowing the digesters, it is an excellent idea—to prevent water hammer from the hot pulp—to warm the blowline below the blow valve by opening the drip cock at the lowest point in the line and blowing steam through it. Many mills do not do this, but it pays.

Blowing at the right time is important. Blowing too early means raw pulp; and holding over too long produces soft overcooked fiber and reduced yield.

After blowing, no time should be lost in preparing for the next cook. Care should be exercised in removing the cover to avoid burns. The pressure gauge should register 0 lb. before attempting to remove the cover. The inside of the digester should be checked with a light on an extension cord to see if blow was clean. If not, sufficient black liquor must be run in and the unblown pulp steamed and reblown. This operation usually results in overcooked pulp. The importance of filling and handling the cook so that blow will be clean cannot be over emphasized.

The cook must remember that the consumption of steam cannot be based on the contents of the digester alone. Much steam is required just to heat the digester shell, and insulation. In addition thereto, radiation must be considered.

Taking a 2,750 cubic-foot digester, with a pulp capacity of about 8¼ tons A.D., the following approximates steam consumption:

1. If the shell varies from 1.13 in. for lower ring to 1.07 in. for upper ring with 1½ in. thick cone bottom and 1⅛ in. thick head, the approximate total volume of steel is 130 cubic feet. This figure x 7.8 (specific gravity of steel) x 62.4 (weight of cubic foot of water at 60 Fahr.) equals the total weight, namely, 63,273 lb. Since the specific heat of steel is 0.117, the water equivalent is 63,273 x 0.117 or 7403 lb. Tests show that digesters this size will cool from a maximum of 337 Fahr. to somewhere near 220 Fahr. between cooks. Therefore, the B.t.u.'s required to reheat are 7,403 x (337-220) or 866,151.

The 2 in. insulation would approximate 209 cubic feet which at 19 lb. per cubic foot would weigh 3,971 lb. Using 0.20 as the specific heat of insulation, the mean between internal temperature of 337 Fahr. and external of 130 Fahr. as 233.5 deg., and the estimated mean temperature at start of cook as 200 Fahr., the heat required to heat the insulation 33.5 Fahr. (233.5 Fahr. —200 Fahr.) equals 3,971 x 0.20 x 33.5, or 26,606 B.t.u.

With chips weighing 21 lb. per cubic foot, the digester would hold 57,750 lb. of wood. Assume 45 per cent moisture in chips, and, consequently, an oven dry weight of 31,762 lb. (water weight 25,988 lb.). Since wood has a specific heat of 0.33 and the chips are to be heated to an average rise of 258 Fahr., the B.t.u.'s required equal 31,762 x 0.33 x 258, or 2,704,216. The 25,988 lb. of water would require 25,988 x 258 deg. temperature rise, or 6,704,904. Now, to heat say 800 cubic feet of white cooking liquor at a specific heat of 0.91 (a density of 1.10) for a temperature rise of 185 Fahr. requires 800 x 62.4 x 0.91 x 1.10 x 185, or 10,399,867 B.t.u.'s. For some 400 cubic feet of black liquor of same specific heat, and 1.10 density, for a temperature rise of 172 Fahr., the B.t.u.'s required are: 400 x 62.44 x 0.91 x 1.10 x 172, or 4,297,413 B.t.u.'s. Taking average radiation loss in 2 in. insulation as 290,000 B.t.u.'s for this digester, the total heat required per cook reaches 25,089,157 B.t.u.'s and converting to pounds of steam at 125 lb. pressure and 353 Fahr. for a 338 Fahr. cook, using an estimated 870 B.t.u.'s per pound (latent heat of vaporization of 125 lb. saturated steam), the pounds of steam per cook totals 28,838. Dividing this figure by the yield per digester of say 8 tons—the per ton steam figure is 3,605 lb. This figure will vary in actual practice from 3,600 to 4,300.

It is very important to save all possible heat both during relieving and blowing digesters. For instance, some 500,000 B.t.u.'s are lost in lowering pressure from 120 to 80 pounds where the blow is made to diffusers—this would heat about one thousand gallons of water 61 deg. Fahr.

Blow steam plants are now considered necessary in all modern mills. With this equipment, steam from each blow passes through a condenser and the resulting hot water on to an accumulator. This water is dirty and cannot be used for washing pulp or other process water but its heat value is transferred to clean water in the flash tank and heat exchanger forming a part of the equipment, and the clean hot water is stored for process work.

Throughout the process of manufacturing sulphate pulp, chemists in the laboratory make tests of many types to secure information and product control, and while technical and chemical knowledge is, to say the least, worth its weight in gold to the man who expects to make pulp and paper his life's work, in the absence of such knowledge it is necessary for the practical man to know at least the tests which apply to his own department. Therefore, a test bench should be a part of the digester room equipment, unless all chemical checks are performed in the laboratory. Even where this practice is followed, the cook still requires process guides to relieve him of as much bookwork as possible. The following guides are very valuable to him:

1. Where recording instruments are used to record the digester steaming, a round metal plate of the same size as the steam chart can be cut out to record the perfect rate for bringing the digester up to pressure, cooking, relieving before the blow (if diffusers are used), and indicating the exact time elapsing between the start and finish of the cooking cycle. With a hole in the center fitting a pin in another plate, the chart is placed over the pin in the bottom plate, face up, and the measuring plate placed over the chart, properly lined up with steam starting time. Then with a pencil, the chart is marked along the perfect steaming line and placed in the steam recording instrument. The operator so manipulates his valves that the recorder pen follows the penciled line on the chart throughout the cycle, thus maintaining uniform steaming. In this way, every cook can be steamed alike and with corrections for liquor, wood, etc., pulp quality is maintained uniformly no matter how many digesters or cooks are involved.

2. For testing the cooking liquor, the operator needs a burette that will adjust to zero (0) when filled, some measuring flasks, and pipettes. He should also have a table showing how many inches of liquor are to be taken from the liquor measuring tanks for the required amount of alkali. This makes it easy to change the active alkali to correspond with changes in the liquor and wood. Such a table can easily be made up by the laboratory chemist from a range of liquor analyses covering the possible range of the mill.

3. To determine the amount of white liquor required for a digester charge, only the active alkali is needed. This figure is the sum of the sodium hydrate and sodium sulphide (NaOH plus Na_2S) and can be obtained from a simple test run by the cook if such tests are not furnished by the laboratory. Where the laboratory does not have a shift chemist making these tests, the cook should learn to make them in accordance with the practice of his mill or use the TAPPI standards which are usually available to him through the chief chemist.

4. The digester cook should also make arrangement to learn how to make a quick analysis of sodium hydrate by titrating a portion of clear liquor with standard solution of normal hydrochloric acid HCl, and phenolphthalein and methyl orange indicators. The procedure can be outlined by the mill chemist and followed at specified intervals by the cook.

5. Permanganate Number test is also very important and the cook should either be provided with this simple accurate test by the laboratory or arrange to run it himself from the standard procedures now being universally used in most southern mills, and available to the industry through TAPPI. There is also another method widely used, known as Pulp Bleaching Corporation formula, which gives very accurate results.

Tests beyond these are the function of the control laboratory and should not be expected of the cook.

A Rapid Method of Evaluating Paper Coatings and Glassine Laminations

WILLIAM T. DIEFENBACH*

▸▸▸ THE CRITICAL POSITION of cellophane and metal foils caused by the war brought about a need for other less critical moisture vaporproof wrappings. This caused a great increase in the use of paper which has been coated or laminated to decrease its moisture vapor transmission.

The waxy film used, either on the surface or between laminated sheets of paper, acts as a moisture barrier. The effectiveness of this barrier is influenced by the nature of the waxy compound used, some compounds offering much more resistance than others. The same compound properly applied to paper should, with certain qualifications, be effective regardless of the stock being laminated.

However, if the paper being coated is loose in texture, nap or fibers may stand up from the sheet and penetrate into and maybe even through the waxy coating. This provides wicks for moisture and reduces the effectiveness of the barrier. Also, if the laminating compound is applied at too low a temperature there will not be a proper adherence to one or maybe the two sheets and the moisture proofing film may be uneven.

In general, the thickness of the film and the evenness of its application are controlling factors. Papers processed with compounds, which are capable of producing excellent moisture vaporproofing if properly applied, may show poor resistance if the compound is laid on in uneven films.

Where the application is so uneven that the bare paper shows through the coating, or where there are blisters in laminated sheets, it is easy to detect the defect. However, where a continuous film is applied to the paper but in a variable thickness, it is much more difficult to see the variation. The lack of uniformity is often not detected visually and is only found out after the treated paper goes through tests for moisture vapor transmission, which tests require days to perform. In the interim, large quantities of paper may be processed and later tests show this processed paper lacks the moisture vapor proofness to meet specifications. This, of course, may involve considerable financial losses as well as troublesome delay to say nothing of the loss of the critical paper.

In a discussion at the 28th Annual Meeting of TAPPI, it was brought out that there is a great need for a quick method of evaluating the mechanical efficiency in the application of coatings and laminations, so as to save delays and expense and to accomplish greater perfection in the final product.

The author's son, Robert, and the author, while carrying on investigations with ultraviolet and other light of short wave length, examined a number of vaporproof coatings on paper as well as laminations of glassine stock. Under the particular light they used, the coatings and laminations examined glowed with a strong yellowish fluorescence characteristic of the coating or laminating compound used. Most interesting was the fact that where the thickness of the applied film varied, there was a variation in the amount of fluorescence noted.

Evenly applied films showed a uniform fluorescence while sheets where the application of the coating was nonuniform, or imperfect, showed the unevenness by darker patches or streaks showing on the fluorescing surface. It seemed that the fluorescence was not merely from the surface but from throughout the compound. Consequently, while the entire surface fluoresced the thicker portions fluoresced more strongly than the thinner, and the difference was very noticeable. Certain compounds used for laminating sheets of glassine fluoresced strongly even through the glassine stock.

Later, careful time-consuming laboratory moisture vapor transmission tests showed that sheets which had thus fluoresced unevenly had poorer moisture resistance than those where the fluorescence was uniform over the whole sheet. The uniform fluorescence was indicative of uniformly applied coating or laminating where fluorescence was observed through transparent stock like glassine.

The table shows the appearance under ultraviolet light together with the laboratory determined moisture vapor transmission values for several different laminations of the same stock with the same laminating compound. In these laminations, 25 lb. glassine was bound to 215 lb. patent coated board, using the same laminating compound in each case. Naturally, the glassine side of the laminated stock was examined with the ultraviolet light, as the transparent glassine allowed the light to penetrate to the coating which, thus exposed, fluoresced.

The moisture vapor transmission tests were made using Payne Permeability Cups in desiccators at 100 Fahr. over a period of 72 hours using a phosphorus pentoxide as the desiccant. The tests were made with 100 per cent humidity in the cup and 0 per cent humidity above the film, giving a vapor pressure of 49.78 mm. against the film.

The second laminated stock with 20#/Ream of compound gave a lower transmission than the first, as would be expected as the first had only 9½#/Ream.

The third stock shows high transmission values even with as high as 19½# of compound used per ream. The fourth shows higher values than the second even though 31# of compound were used per ream which is very high. Both the third and the

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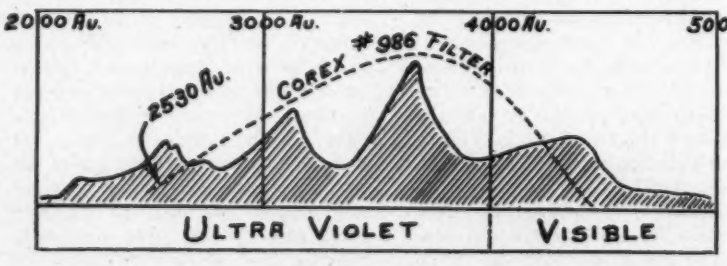

Quartz tube mercury vapor lamp with Corex No. 986 Filter.

Fluorescence under Ultraviolet Light	Weight of Laminating Comp'd Used	Moisture Vapor Transmission in Grams per 100 Square Inches				
		1st 24 hrs	2nd 24 hrs	3rd 24 hrs	24 Hour Average Over 48 hrs	Over 72 hrs
Uniform	9½#/Ream	5.61	6.62	0.64	6.12	4.29
Uniform	20#/Ream	3.16	3.10	2.12	3.13	2.77
Blotched & Streaked	19½#/Ream	13.60	18.40	8.78	16.00	13.60
Streaked	31#/Ream	4.25	3.80	4.50	4.02	4.20

fourth stocks, however, showed a blotched or streaked fluorescence under ultraviolet light. This was indicative of the uneven coating or lamination.

In carrying out the above tests, a portable ultraviolet light equipment was used which had a quartz mercury vapor lamp. The lamp was made by the R & M Mfg. Co., of Pasadena, California, and was designated as R&M #15 Ch. (Cold Type). It is rich in wave lengths responsible for a wide range of important fluorescent effects—75% at 2,536/4,000 Au. This lamp is simple to operate as it is simply plugged into a 110-volt 60-cycle outlet.

A Corex #986 Filter was placed over the lamp. This is claimed to remove waves shorter than 2,530 Au and also most of the visible spectra. The removal of the visible spectra enabled the fluorescence to be more carefully noted.

The general effect of the filter is indicated in the rough sketch. Actually there is not an emission of all wave lengths from 2,000 to 5,000 Au as shown, but wave lengths of certain bands are emitted, the intensity of which is greater for some than for others as indicated in the sketch. A more accurate diagram of wave lengths emitted by a quartz mercury lamp is given on plate opposite page 28 in Fluorescence Analysis in Ultra Violet Light, 1939 edition.

This very rapid method of evaluating the mechanical efficiency of coating or laminating operations should be most helpful to the trade. Of course, the effectiveness of the laminating or coating compounds must be known beforehand as this method merely checks the evenness of application of the coating.

A word of warning should be given to those unfamiliar with ultraviolet light. Too long an exposure can produce serious burns. Also, glasses should be worn to protect the eyes from harmful irritation.

Southland's Kraft Pulp Mill and Bleach Plant

C. C. PORTER, Chief Chemist
Southland Paper Mills, Inc.

▶▶▶ THE FIRST UNIT of the Southland mill consisted of the groundwood mill, newsprint mill, power house, and auxiliaries. The second unit, which was started up in February of 1944, consisted of the kraft pulp mill and bleach plant. The combined mills now constitute a complete unit capable of producing newsprint, bleached kraft, unbleached machine dried pulp, and wet lap pulp either bleached or unbleached.

Woodyard Operation

Woodyard operation for the groundwood mill consisted of the usual yard with a single barking drum, followed by a rubber sorting belt. To expand operations for the kraft mill, a multichain belt was installed parallel to the sorting belt to receive logs sorted to the groundwood mill and feed them to that conveyor. Logs retained on the sorting belt drop to a new conveyor which leads to the chipper. Operation in general is simultaneous to both mills in order to allow sorting of the sticks with fewer knots to the groundwood mill.

Wood for the kraft mill is chipped in a 100-inch diameter four-knife Murray chipper. The chipper is followed by two Orville Simpson Rotex screens. Rejects from the screens pass through a Murray chip crusher, chips from the crusher going directly into the accepted chips from the screens. Sawdust passing the screens is blown back to the bark conveyor and ultimately burned. Chips from the screens fall to a steel flight conveyor where they are elevated to an outside storage tank. This tank holds the equivalent of about eighteen cooks, and is equipped with electric vibrators which feed the chips onto a rubber belt conveyor for transportation to the digester loading floor.

Digester Room

In the digester room, there are three Chicago Bridge and Iron Company 2,750 cubic-foot digesters, which individually yield 8½ tons air-dry pulp. The usual measuring tanks for white and black liquor are provided, as well as the necessary piping for steam, gas off, liquor, etc. A central control panel provides the instruments necessary, such as pressure and temperature on each digester, steam flow on each digester, and total steam flow. An outside blow tank, which holds three cooks, is connected with a heat recovery system from which the hot water is used in the wash room, caustic house, and bleach plant. Each digester has a liquor circulating system in which the liquor is withdrawn from the middle of the digester and returned to both the top and bottom.

Washing and Screening

Improved Paper Machinery Corporation equipment is used in the wash room and screen room. Stock is washed on three-stage washers equipped with a-c. d-c. drive by which the speed of each washer may be controlled with a rheostat. A control panel holds recording flowmeters for wash liquor on each stage, air bubble type liquid level recorders show levels in each stage tank and evaporator feed storage. All switches are also mounted on this panel. Stock from the third stage washer drops into a tile chest, and from there is pumped to a combination consistency regulator and stock meter. Stock from the meter is diluted and feeds by gravity to knotters where the coarser rejects are eliminated. The effluent from the knotters feeds by gravity to the primary screens and from there to a single decker. Stock from the

decker drops into one of two tile chests, the second chest being connected with a 36 inch equalizing line. Screened stock is then pumped to the bleach plant, wet lap machines, and cylinder machine chest.

Evaporator and Recovery Room

The black liquor filtrate from each washer goes to its own stage tank, liquor in storage there being recycled to the washers in the usual countercurrent flow procedure. The stage tank for the first stage washer is a compartmented tank with outside foam vents leading the foam from the lower compartment to the upper where a steam shower reduces the foam to a liquid which subsequently drains back down to the bottom section. Second stage liquor is used for fill back in the digesters while the evaporator feed storage tank is maintained by liquor from the first stage foam tank. First stage liquor is also used for blow tank dilution. The black liquor system is entirely closed, the soda content of the washed stock and soda loss up the recovery boiler stack constituting the only soda losses.

Evaporation is carried out in a Goslin-Birmingham four-body, quadruple-effect, long tube, vertical evaporator train. The usual backward feed is employed as in all black liquor evaporators. In order to conserve water, a surface condenser is employed to maintain vacuum instead of a barometric leg. Cooling water for the condenser is picked up from the gravity header supplying the newsprint mill, pumped through the condenser and into the gravity header supplying the pulp mill and bleach plant. Condensate is pumped from the hot well of the condenser to the sewer in the conventional manner. Further evaporation is carried out in two Combustion Engineering Company disc-type evaporators which utilize flue gas from the recovery boiler.

Recovery of soda is carried out in a Combustion Engineering Company recovery boiler. Approximately 70,000 pounds per hour of 600 pound, 730 degrees Fahr. steam is generated by the boiler. Automatic combustion controls regulate firing conditions, while recording ampmeters on the motors driving the disc evaporators indicate liquor density. Smelt from the furnace runs into a 20,000 gallon dissolving tank which is operated continuously to feed green liquor to storage.

Caustic House and Lime Kiln

Green liquor from the dissolver is fed to a Dorr clarifier from storage. A recording and controlling flowmeter governs the rate of flow through the plant. Slaking is carried out in a Dorr slaker which also rakes out the grits, after which the mixture travels through three reaction tanks to a pump sump where it is picked and sent to a Dorr white liquor clarifier. Clarified white liquor is stored in two tanks for use in the digester room. Washed mud is pumped from storage to a horizontal type lime kiln for calcining. Natural gas is used for fuel, a rotating Fanmix burner holds the air-gas ratio almost constant at different rates of firing. Control instruments in the caustic house include controlling and recording flowmeters for green liquor and hot wash water, recording and controlling temperature meter for green liquor, recording temperature after slaking, recording density meters on green and white liquor showing Baume, liquid level gages on all storage tanks.

Bleach Plant

The bleach plant consists of three towers—chlorination, caustic, and hypochlorite stages. Improved Paper Machinery Corporation equipment is predominant. All towers are constructed of acid proof tile, and normally hold about eight tons A.D. pulp. Brown pulp is fed into the plant through a combination consistency regulator and stock meter. Pulp from the meter drops to a pump at the base of the tower and then passes through a mixing chamber where gaseous chlorine is added from a rotometer. After flash mixing, the chlorinated pulp passes into the tower where it rises. The overflow from the tower is diluted and drops by gravity to the washer vat. After washing the pulp, then continues to the other stages in a similar manner. Bleached pulp is stored as slush in a tile stock chest which supplies the requirements for the furnish on the newsprint machine.

Pulp Machine

For the production of machine dried, unbleached pulp—a second-hand cylinder machine was installed and reconditioned. This machine is a five vat, 48 dryer machine, trimming 122 inches, and has one calender stock. Reels are rewound on a four-drum winder and cut into rolls for shipment. Two Emerson Jordans are used to brush out the stock supplied to the machine.

The Foreman and the Individual Worker

Union agreements and broad management labor policies establish basic working conditions for all employees. Over and above such plant-wide programs, however, you are still faced with the problem of dealing with the individual worker in your department as a separate and distinct human being, different from every other man or woman in the plant.

No matter how good the general working conditions or how satisfactory the labor relations, there is no substitute for the individual contact of foreman and worker. John Jones and his sister Susie, Mike O'Brien, and all the rest want to be considered as something more than a number, either on a company time clock or a union membership list. They want to be recognized as individuals.

Let's put it this way. No amount of personal interest on the part of a good supervisor will compensate a worker for unreasonably low wages or unfairly handled lay-offs or promotions. Under such circumstances the best-intentioned interest of supervisors may be interpreted as paternalism or favoritism.

On the other hand, given two plants where wages and other basic working conditions are equally good, the average worker will choose the plant where he can work for a boss whom he likes and respects and where a general atmosphere of friendliness and co-operation prevails.

This has been borne out over and over again by interviews with workers who have changed jobs during the present labor shortage. The worker who is dissatisfied, unhappy or frustrated on his present job looks around for another and naturally is attracted to the highest-paying work he can find. But even the availability of higher-paying jobs will not usually cause the worker who likes his present work and his boss to quit. In other words, wages aren't everything.

The experienced foreman recognizes the human need for recognition and personal consideration. He appreciates the importance of good wages and good working conditions. He understands the need for systematic personnel procedures. If there is a union in the plant, he does not try to by-pass the union representative or substitute individual bargaining for collective bargaining.

But over and above all these collective relationships, he is interested in his employees as human beings and takes the trouble to try to understand them — as a group and as individuals. (From *The Foreman's Guide to Labor Relations*, published by the United States Department of Labor.)

Some Recent Court Decisions of Interest to the Paper Industry

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▶▶▶ THE HIGHER COURTS recently rendered several unusually important decisions which concern the pulp and paper industry. Some of these decisions reverse older law. Therefore, in this article the most outstanding new higher court decisions shall be reviewed as an aid to readers in avoiding law suits, also as reference material to be used in the event of unavoidable suits.

Two Laws Conflict

Frequently the maximum price fixed by the Office of Price Administration conflicts with other valid laws. Always the higher court must be resorted to and it will decide which law is effective.

For example, in Soundview Pulp Company vs. Taylor, 150 Pac. (2d) 839, reported September, 1944, it was shown that a representative of the Soundview Pulp Company was the highest bidder at a public auction of timber grown on state school lands, but was informed by the Office of Price Administration that its bid was in excess of the ceiling price for the timber as provided under Maximum Price Regulation and that if it consummated the purchase the Price Administrator would hold it responsible for a violation of the Emergncy Price Control Act. The Soundview Pulp Company deposited the amount of its bid with the State. Being unwilling to incur the risks of penalties and possible criminal actions for violation of the act and the regulation, the Soundview filed suit praying that it be required to refrain from paying the money deposited into the state treasury and not consummate a sale of the timber to it until the United States could be allowed to intervene in the action and the court determine whether the bid was lawful. At the auction a representative of another pulp company had submitted a bid of less amount than that of the Soundview Pulp Company but was for the maximum price fixed by the Office of Price Administration for the timber.

During the trial, testimony was given showing that a state law clearly provides that the state authorities must sell its lands or property at auction to the highest bidder. The lower court held that the Soundview Pulp Company could not make the purchase and that the bidder whose bid complied with the ceiling price was the legal purchaser and entitled to the timber and land. However, the higher court reversed this verdict and in holding that the OPA ceiling price was not effective to invalidate a state law, this court said:

"It would seem that..... that a grave doubt exists as to whether Congress in enacting a war measure relating to the fixing of prices at which commodities may be sold has the power to make it applicable to a state with reference to property it owns and holds for the purpose of carrying on its governmental functions."

Suit Dismissed

According to Section 15 (a) (1) of the Fair Labor Standards Act no manufacturer of paper, or paper products, is legally permitted to use pulpwood produced by producers who do not conform with the Fair Labor Standards Act. Willful failure of a manufacturer to comply with these requirements may result in heavy liability. However, a recent court held that introduction of proof that an honest effort is being made to conform with this law relieves the manufacturer from all liability.

For example, in Walling vs. Gulf States Paper Corporation, 143 Fed. Rep. (2d) 301, reported August, 1944, it was shown that a paper corporation purchased pulpwood from certain producers who had not observed the wages and hours provisions of the Fair Labor Standards Act. After receiving notification from the Administrator of the Wage and Hour Division, that certain of the pulpwood producers were violating the Act, the paper corporation discontinued doing business with such violators. Sixty days after receiving the notification from the Administrator of the Wage and Hour Division, the paper corporation did not have on hand any pulpwood delivered to it in violation of the Act or any paper or paper products of which any such pulpwood was an ingredient. Nevertheless the Administrator of the Wage and Hour Division filed suit against the paper corporation. It is interesting to observe that the lower court dismissed the suit and the higher court approved the verdict, saying:

"Upon having these violations brought to their attention by the investigators, such producers and sellers demonstrated a willingness and desire to comply with the provisions of the Act."

Law of Adverse Possession

It is well known that a person may acquire legal title to real estate by adversely taking and holding possession of such property with knowledge of the true owner. This is known as "adverse possession."

In all states a person who, for example, fences property belonging to the owner of adjoining land may acquire title good and legal to the fenced-in property after expiration of a definite period of years specified by laws of the state in which the land is situated. The length of time varies from 6 to 27 years in the different states. Recently a higher court held that the fact that a person occupies a *part* of a tract does not mean that he can adversely claim title to the whole tract.

For illustration, in Anthony vs. International Paper Company, 180 S. W. (2d) 828, reported July, 1944, it was disclosed that a paper corporation owned certain land and cut the timber therefrom for making pulpwood. The owner named Anthony of adjoining land sued the paper corporation and alleged that he had by "adverse possession" acquired title to the land from which the timber was cut. The land was wild and unimproved and the paper corporation had continuously paid taxes thereon from time of acquisition. During this period Anthony had occupied 20 acres of the 60 acre tract. In holding that Anthony was not the legal owner of the whole 60 acre tract, the higher court said:

"Appellant (Anthony) contends that, because he has been in the actual possession, for more than seven years, of a portion of the 60 acres of land owned by him, he has become the owner of all the land including appellee's (paper company's) 40 acres. This is not correct and would work a manifest injustice to the true owner."

Authority of Public Service Commission

Modern higher courts always uphold the validity of freight rates established by a Public Service Commission unless the testimony positively indicates that such rates are unreasonable and confiscatory.

For example, in North Carolina Utilities Commission vs. Atlantic Coast Line Railroad Company, 29 S. E. (2d) 912, reported July, 1944, it was shown that a railroad company objected to an order of the North Carolina Utilities Commission relative to the rates on pulpwood shipped over its lines to Plymouth, North Carolina. Suit was filed and the testimony showed facts, as follows: The Utilities Commission authorized carriers by railroad operating in North Carolina to increase their rates on pulpwood, but limited the increase to 5 per cent. Thereafter application was made by the rail carriers for an increase of 10 per cent on the pulpwood rate be authorized on intrastate shipments. After full hearing the Commission refused to allow the carriers to increase the rates. Notwithstanding these facts the Atlantic Coast Line Railroad Company filed with the Utilities Commission tariffs containing new and higher rates on pulpwood. Without waiting for the Commission to authorize an increase of the rates the railway company filed tariffs showing an increase. The higher court upheld the validity of the rates established by the Commission and said:

"These rates so established must be deemed the only just and reasonable rates for this commodity over defendent's lines, rendering it unlawful for the defendent (carrier) to charge a greater amount."

Ceiling Price Upheld

Modern higher courts hold that irrespective of excuses, manufacturers and sellers must adhere to prices fixed by the OPA.

For example, in Buckley vs. Bowles, 143 Fed. (2d) 877, reported September, 1944, it was shown that a manufacturer of paper products was to issue a new catalogue quoting higher retail prices. However, publication of the catalogue was delayed. In the meantime the manufacturer contracted to sell certain products to a seller at the higher prices listed in the new catalogue, because actually he was losing money selling at the old catalogue prices.

On May 11, 1942, the prices became subject to the General Maximum Price Regulation, which had been issued on April 28, 1942. This regulation fixed as the maximum price the highest price which the manufacturer had charged for the same commodity delivered by him in March, 1942. It was the manufacturer's misfortune that its price increases listed in the new catalogue and which went into effect for deliveries on and after April 1 just missed coming within the deadline set by the regulation.

The manufacturer argued that he was not compelled to sell his products at the price of March, 1942, because he would have raised his prices to all purchasers if publication of the new catalogue had not been delayed due to a trade-mark litigation.

However, the higher court held that the manufacturer must sell his products at the old prices, and said:

"It is immaterial that complainant's price increases would have been made earlier had not Ryan's issuance of the new catalogue been delayed by the pendency of trade-mark litigation brought against Ryan by competitors."

Suit Not Outlawed

Any bona fide intent to prosecute a suit diligently and without unreasonable delay in issuance of service of summons is the legal date when the suit was commenced.

For example, in International Pulp Equipment Company vs. St. Regis Kraft Company, 55 Fed. Supp. 860, reported September, 1944, it was shown that a state law provides that a suit against a dissolved corporation must be filed within three years of its dissolution.

A firm filed suit against the dissolved corporation and served its former resident agent within the three year limitation period. However, this service was invalid and the firm waited three and one-half years before it obtained issuance of new summons to the Secretary of State. The court held that the action was "commenced" within the limitation period notwithstanding that the issuance of the summons to Secretary of State occurred more than three and one-half years from date of corporation's dissolution.

Paper Mislabeled

The Food, Drug, and Cosmetic Act makes it unlawful to mislabel certain products. However, a late higher court held that this law does not apply to paper products.

For illustration, in United States vs. Willard Tablet Company, 141 Fed. (2d) 141, reported May, 1944, it was shown that suit was filed by the United States of America against a paper product company for condemnation of a quantity of tablets shipped in interstate commerce on the ground that the labeling thereof was false. The suit was based upon a violation of the Food, Drug, and Cosmetic Act.

The higher court held that paper products of this nature are not subject to this Act and said:

"What we have heretofore said sufficiently disposes of the argument that the decisions of the Federal Trade Commission should not be allowed to impair the enforcement of the Food, Drug, and Cosmetic Act. Under the facts stipulated herein and to which this decision is limited, there can be no impairment of the enforcement of the aforementioned Act."

Employee's Arm Crushed

Generally speaking, the employment of any minor, known to be such in violation of certain state laws comprises serious and wilful misconduct upon the part of the employer. Therefore, in many states employers who employ minors may be subjected to payment of double compensation or damages for injuries sustained by minors.

For illustration, in In re West, 46 N. E. (2d) 760, it was shown that a young man less than eighteen years of age, was hired and put to work on a carding machine, a machine consisting of a series of revolving rolls, the surfaces of which were covered by fine brush like wire that combed the material as it was drawn through the machine. Lint from the material supplied to the machine became gradually accumulated upon the wires on the surface of these various rolls, and it became necessary from time to time to clean it. One day while the young man was cleaning the roller or cylinder which was in motion, his arm was drawn into the machine and was so badly injured that amputation was necessary. He sued the employer for double liability.

Although the lower court refused to hold in favor of the employee the higher court reversed the verdict, and said:

"The evidence supports the finding that the employer knew that the employee was a minor."

Obviously in all cases or suits involving injuries the employee is not entitled to recover compensation or damages, unless he proves that the injury arose out of and in the course of his employment, and that he himself was free from serious and wilful misconduct.

Another important point of law is that where at time of a compensation award, both the employee and employer were of the opinion that the employee was suffering only from a minor injury, but it was thereafter discovered that the employee was seriously injured there is a "mistake of fact" which justifies the Industrial

Board in vacating the award and making a new one.

For illustration, in Terre Haute Paper Company vs. Price, 47 N. E. (2d) 166, reported July, 1944, it was shown that an employee accepted compensation believing that he was suffering from a sprained back. Later he discovered that he was suffering from a rupture of the intervertebral disc between the fifth lumbar and the first sacral vertebrae of his spinal column. The higher court held that the employee was entitled to receive another award for compensation, and said:

"A mistake of fact takes place either when some fact which really exists is unknown, or some fact is supposed to exist which really does not."

In another case Lee vs. International Paper Company, 16 So. (2d) 679, it was shown that an employee was earning $40 per week before total and permanent disability. When the original compensation award was made it was not known that the employe was totally disabled. The higher court held that when the employee was paid compensation for seven weeks and wages for 24 weeks after the injury, the employer was entitled to a credit therefor on the later judgment in favor of the employe for total and permanent disability.

The court said that if it were otherwise the employee would receive "double" compensation for a certain period of time.

National Labor Relations Act

Violation of the National Labor Relations Act may be proved by circumstantial evidence.

For example, in P. H. Glatfelter Company vs. National Labor Relations Board, 141 Fed. (2d) 631, it was disclosed that an employee, named Baublitz, had been employed by a corporation for about seven years in its digester room and was an operator in that room. The digester room of the plant contains five digesters which are used in cooking wood pulp; and two washers for cleansing the cooked pulp mass of the used solution. One day Baublitz left the digester room about twenty minutes before quitting time. This was in line with the usual custom. Baublitz testified that he told his helper, Dubbs, that he was leaving in order to clean up. Baublitz further said that Dubbs answered that he would watch the digester. About ten minutes prior to the end of the shift, Dubbs shut down the washers in the digester room, but not the conveyor itself. Later it was found that the conveyor chain was slipping and that a sprocket wheel was broken. This breakdown held up the pulp mill for about six hours.

Soon afterward Baublitz was demoted from operator to laborer in the yard at a 10 per cent reduction in pay. The testimony showed that sprockets had previously been broken but no operator had ever been disciplined as a result thereof. The higher court held that the corporation had violated the National Labor Relations Act, and said:

"In view of all the facts and circumstances of the conveyor incident, there was substantial evidence for the Board to find as it did that 'the real reason' for Baublitz's layoff and demotion was 'his membership in and activity on behalf of the Union'."

Tax Cases

In United States vs. Hill, 142 Fed. Rep. (2d) 622, reported July, 1944, it was shown that a copartnership was engaged in manufacturing paper products. It transferred its operating assets to a corporation formed to continue the manufacturing business and it transferred its liquid assets consisting of bonds and stocks to trustees under a trust agreement. The purpose of trust was to hold and use the real property for the benefit of the corporation. The higher court held that this trust was a "business trust" and taxable as an "association" under the Federal income tax laws.

In Hinde and Dauch Paper Company vs. Evatt, 55 N. E. (2d) 129, reported June, 1944, it was disclosed that the furniture and fixtures of a lodge and cottages used by a paper manufacturing company was used for entertaining employees, customers and prospective customers. Also, holding of meetings of district managers and occasionally directors' meetings were held in the lodge.

The question presented the court was whether the lodge furniture was "used in the business" of the corporation when figuring tax payment. The higher court held in the affirmative and said:

"The federal authorities permit expenditures for such purpose as that for which this property was used to be deducted as expenses of business operation in computing income taxes."

In other cases the courts held expenses as *company* expense, as follows:

Expenses of employees' dances and picnics (Popular, 6 B. T. A. 78); the cost of the operation of a yacht for the entertainment of customers and employees (Dickinson, 8 B. T. A. 722); and expenses of a playwright and theatrical manager for traveling, entertaining actors, employees and dramatic critics (Cohan, 2 Cir., 39 F. (2d) 540).

Cellulose Production in 1943 Only About One Million Tons

The stocks of cellulose in Sweden now amount to about 700,000 tons, and the reserves of pulpwood are also considerable. Below are the 1943 production and export figures for the Swedish forest industries, compared to averages for the 1937-1939 period.

Cellulose	*1943*	*1937-1939*
Production	1,060,000	2,540,000
Export	426,000	1,970,000
Paper		
Production	600,000	900,000
Export	180,000	550,000
Lumber		
Production	1,020,000	1,360,000
Export	220,000	770,000

The current shortage of wood pulp and lumber in many countries was discussed in an editorial article in the leading Swedish business weekly, Affärsvärlden, for September 7. (This publication was the first to reveal the Swedish-British negotiations which led to an agreement to ship Swedish cellulose to Britain for a year after the war is over at the rate of about 20,000 tons a month.) It said that although Sweden will for some time be the only nation able to supply England, France, Belgium, the Netherlands, and Denmark with lumber, she intends to do her best to keep prices moderate. If excessive prices were paid by the European consumers wood prices in Sweden would soar too, and sooner or later there would be a serious reversal.

As long as Sweden is practically cut off from the oceans, the outlook for her wood pulp industry remains gloomy indeed. Last summer her total exports of cellulose during 1944 were estimated at 300,000 tons, compared to some 425,000 tons in 1943 (the production capacity is about 3,000,000 tons a year). Since then Sweden's trade with Germany has virtually ceased.

Control Instruments in Kraft Pulp Mill Recovery Operations

C. W. WILKINS
Process Engineer

▸▸▸ ABOUT 240 CUBIC FEET of black liquor is obtained from one ton of kraft pulp. To concentrate this liquor continuously, the first step in the chemical recovery process it is necessary to provide surge-storage space (black liquor storage tanks) ahead of the evaporators. Provision for less than six hours leeway, or 60 cubic feet of storage space per ton, would hardly be safe. Actually, about double these figures is needed because of foam.*

Recording liquid level gauges calibrated in feet of depth or density gauges for reading degrees Baumé may be installed on these tanks. Gauges operating on pneumatic principles are most popular for this application.

Flowmeters of the recording or integrating type are usually installed on the evaporator feed line and also on the liquor lines leading to storage. These instruments are commonly of the orifice type with oil seal. V-notch weir meters also have been used for the same service.

Some years ago, the old calandria type of evaporator was widely used in the concentration of black liquor. Today, the forced circulation "non-foaming" type of evaporator is almost universal.

Gauges to indicate temperature, pressure and vacuum are commonly installed on each effect. In some cases, recording instruments are used.

It has been suggested that evaporator operation could be made automatic by suitably balancing the rate of feed against the vacuum produced by the barometric condenser. Failure to adopt this technique is due to two things: (1) lack of foolproof automatic devices, and (2) impossibility of any saving in labor cost.

The black liquor, concentrated in the evaporator from around 14 to 18 per cent solids to about 45 per cent, goes to surge-storage and then to the recovery furnace. Essentially a blast furnace, the recovery furnace, during the past decade, has become a steam generator, supplying most, if not all, of the steam required by the entire pulp mill. Consequently at this point in the chemical recovery operations, there is the usual steam generator instrument control panel with feedwater temperature control, automatic blowdown control, draft indicators, pressure gauges, steam flowmeter, temperature recorder, etc. In addition, both pressure indicators or recorders and automatic temperature controls are required on the furnace, the pressure instruments for controlling the primary air supply, and the temperature controls for the black liquor.

Recording flowmeters may be used on the furnace for controlling the black liquor, but they have not become universal because of difficulties in providing an effective trouble-free seal between the thick gummy liquid and the mercury pool in the body of the instrument.

Recently, two flowmeters have been proposed for this service. Both of these instruments have the usual orifice but they vary in the means employed to convert the pressure variations into movement of the pen arm.

One instrument uses an oil seal in contact with the black liquor on one side and with water on the other. The water surrounds a thin metal bellows which moves by compression or expansion in response to pressure changes caused by variations in rate of flow. This bellows movement actuates the pen arm. Temperature compensation is provided by an electric heater which maintains the water surrounding the bellows at a uniform temperature. This meter is giving satisfactory service on at least one furnace.

The other instrument (so far as the author knows) has not been applied to concentrated black liquor but it is in use on a thick viscous tarry material of similar character. It uses an oil seal in contact with the liquor and, through flexible connection, with mercury which partly fills a hollow ring. This ring is divided by a partition at the top where it is supported by a knife edge resting on an agate bearing similar to that used in an analytical balance. Slight variations in pressure cause the mercury to rise on one side or the other in the hollow ring, thus producing a movement which actuates the pen arm.

Salt cake—the make-up chemical—is fed into the concentrated black liquor just ahead of the sprays through which the liquor enters the furnace. An adjustable variable speed mechanism governs the rate of this feed.

The salt cake does not dissolve in the black liquor; rather it is held in suspension. Consequently, finely divided salt cake is preferred. In fact, a specification that would call for a salt cake of which 95 per cent would pass through 100 mesh and none of which would be retained on 20 mesh would not be too severe.

It would be advantageous to have some type of recording or indicating meter in order to keep an accurate account of the salt cake used. The rate of feed, however, is too small for any of the usual continuous weighing devices that have come under the author's observation.

Some type of waste heat concentrator (operating like a set of steamboat paddle wheels) is usually employed between the evaporator and furnace. In the older mills of a decade or more ago, the Enderlein disc was common. Today, the Murray-Waern cascade type is more favored. In this latter case, the concentrator churns up the black liquor in an enclosed channel through which the hot gases from the final pass of the steam generator are conducted. Thus, the splashing black liquor is brought into intimate contact with these gases and absorbs both heat and dust (flyash). Ammeters on the motors that drive the paddle wheels are used by experienced operators to indicate the work which is being done by a concentrator, and the rate of flow of black liquor into a unit is governed accordingly.

This use of the ammeter has led to the idea of possibly utilizing a recording instrument operating on the same principle as the Thyle consistency regulator. Variations in the torque on the shaft driving a spindle submerged in the liquid and turned by a motor with floating field should be a measure of the solids content. The calibration of such an instrument, however, is complicated. In these concentrated black liquors, it is necessary to deal with thixotropy as well as with viscosity.

In addition to generating steam, the operation of the recovery furnace both evaporates the remainder of the water and burns out the organic matter from the black liquor and also reduces

*For details of a simple effective foam breaker, see THE PAPER INDUSTRY AND PAPER WORLD, July, 1944, p. 462.

the sodium sulphate to sodium sulphide. As a result of these actions, a molten mass of mineral matter, chiefly sodium carbonate and sodium sulphide, is deposited on the bottom of the furnace. Water cooled spouts are provided to permit this smelt to flow from the furnace into a dissolving tank which is located below it.

Experienced operators can judge furnace operation by the appearance of the flow of smelt. The temperature of the smelt can be determined with an optical pyrometer. Such variables as rate of feed, air pressure on the nozzle, induced draft, etc., might be correlated with smelt temperature through the use of a recording pyrometer to give smoother operation.

One very important control is the reduction of sodium sulphate to sodium sulphide. The efficiency of this operation is determined by gravimetric analysis of the green liquor produced in the dissolving tank. Although it is not apparent how this testing could be done otherwise, it might be possible to employ some optical method that would at least indicate trends in changing sulphide content of the smelt.

For example: The melting point of sodium sulphide is lower than that of the carbonate. So the melting point of the smelt is affected by the sulphide content.

For any given furnace, the effect of other variables might conceivably remain sufficiently constant for the smelt temperature to indicate rather closely the ratio of sulphide to carbonate. Then, for any definite rate of addition of salt cake, the per cent reduction would follow.

Admittedly, this method is rather complicated for measuring reduction. It hardly seems likely that any instrument manufacturer soon will bring out a "reduction meter" with scale calibration universally adaptable to all recovery furnaces. However, it does seem possible that a recording optical pyrometer would permit an operator to maintain high reduction.

Wash liquor from a subsequent operation is used to dissolve the smelt in the dissolving tank. In addition to sodium carbonate and sodium sulphide, the smelt contains a number of compounds in smaller concentrations. Of these compounds, perhaps the most troublesome are compounds of iron, such as double iron sulphides. They probably are the chief cause of the color of the liquor in the dissolving tank and from which it takes its name: namely, green liquor.

Before the development of the steam generating recovery furnace, green liquor was made up in batches. Each batch was pumped out whenever the proper degree of concentration had been reached. Causticizing followed immediately, also in batches, and the lime sludge incident to the operation was discarded.

With the advent of recovery kilns for the lime, it became necessary because of the continuous operation of a kiln, to convert these batch operations to a continuous process. Upon so doing, it soon became evident that these troublesome impurities must be removed before adding the lime. Otherwise, they would precipitate in a large degree with the lime sludge and would carry through a kiln and accumulate with each repass.

At first, attempts were made to filter the impurities from the green liquor. However, it was soon found that they formed a slimy film that effectively sealed the filtering area, thus stopping the filtration. Consequently, removal of the impurities by sedimentation had to be adopted.

Complete removal of double sulphides of iron and sodium from the green liquor cannot be effected without cooling to a very low temperature, and even then prolonged settling is necessary. Fairly efficient removal of these and grosser impurities, however, is accomplished readily in multi-tray clarifiers of well-known type. In such a clarifier, the dregs are removed and washed continuously. They are usually disposed of by dumping, the wash water going to the dissolving tank.

This conversion from batch to continuous flow operation has not, as yet, led to any change in control methods. It is still necessary to determine by titration the rate of increase in concentration of the green liquor and to govern the rate of flow accordingly. Automatic conductivity control has been suggested, but the case is far more complicated than the markedly successful application to neutralization with dilute acids where the highly mobile hydrogen ion is an important factor.

The rate of addition of lime for causticizing is governed by a variable speed feed mechanism. This mechanism is adjusted manually in order to maintain the proper degree of causticity in the settled white liquor as determined by two simple titrations.

Flowmeters may be used to determine the rate of delivery of clarified green liquor from storage to the causticizer. It might be possible to have both lime feed and green liquor flow controlled automatically and in unison after the manner of the interlock speed control on a paper machine. Here again, however, there could be no reduction in labor. An operator would still be required to make the necessary titrations.

Sludge removal, following the addition of the lime, is effected by continuous settling, usually in multi-tray decanters. The settled sludge is made into a slurry and the wash removed by further decantation. Then the sludge is finally dewatered on rotary filters and calcined in rotary kilns.

Once green liquor concentration, its rate of flow, and lime feed rate are fixed, the only variables remaining are temperature and speed of agitation.

Correct temperature in causticizing is important. It may be controlled automatically by any one of several familiar devices used to govern the amount of steam used. Liquid level and flowmeter recorders may be used at various points. "Torque meters" on the decanter agitator drives are useful to prevent damage through overloading. Flowmeters on oil feed to kiln burners are essential to economical operation. Also, recording pyrometers and draft gauges are valuable.

From the white liquor clarifiers, the white liquor flows to surge storage from which it is pumped as needed to the digesters. Flowmeters and liquid level recorders may be used on storage tanks and pipe lines to round out the complete record from wash room back to digester room.

◆

When an Accident Happens

Q. *What attitude on the part of supervisors and foremen frequently stands in the way of preventing a repetition of an accident?*

A. All too often, after an accident has happened, a supervisor takes the attitude that the accident is "water over the dam." True, every effort should be made to prevent the occurrence of accidents. But when an accident does happen, a thorough checking of the facts will point the way to removal of causes of a repetition.

Q. *In checking the causes of an accident, why is "carelessness" an unsatisfactory explanation?*

A. Because "carelessness" is itself the *result* of certain causes which should be identified. Merely to say that an accident resulted from carelessness does not help to get at the real root of the cause. No supervisor should be satisfied until he gets all the facts about *the causes of the careless attitude* of the employee.

Q. *Who has the* first *responsibility for getting all the facts about an accident?*

A. The responsibility lies with the supervisor immediately in charge of the work where the accident occurred. Unless he checks the facts the real remedy is not likely to be applied.

(From *Management Information*, published by Elliott Service Company, New York City.)

Bill Bridges in stand of longleaf pine thinned for pulpwood, Orton Plantation, Wilmington, N. C. Bill is now a captain in the Army.

Getting Pulpwood for the Georgetown (S.C.) Mill

LOCKE CRAIG

▸▸▸ THE INTERNATIONAL Paper Company, Southern Kraft Division (Georgetown, S. C.) has been making a determined effort since 1938 to promote better forestry practices among private landowners in the territory from which the mill draws wood. This territory includes most of South Carolina, part of North Carolina and part of Georgia.

In 1938, the Southern Pulpwood Conservation Association was formed with Frank Heyward, Jr., as forester and general manager, and the Georgetown mill, along with other leading pulp and paper mills, became a member. In connection with this program, the Georgetown mill appointed Bill Bridges as conservation engineer. Bill immediately embarked on a program of education and assistance to the private landowners in the mill's territory. Leaflets containing pictures and authentic data showing the advantages of good forestry were distributed, many personal contacts were made and numerous demonstrations, both independently and in connection with the State Forest Service and other public agencies, were held. These demonstrations consisted of actual cuttings and sample marking showing just which trees to cut and which ones to leave. They were held in widely distributed areas in order that as many of the public as possible could be reached. All nearby landowners were invited to these demonstrations. The program was well received and so many calls were received for help in marking trees for improvement cuttings and thinnings that the mill employed an assistant for Bridges, and Bill was also able to influence many of the wood contractors in hiring technical foresters to assist in the program.

By joining the Southern Pulpwood Conservation Association the mill pledged itself to comply with the cutting rules set up by the association. These rules were designed to insure a future crop of timber on the land cut over. Therefore, periodic inspections were made of cuttings where the timber had been bought in bulk or by the cord in a straight timber sale where no marking was to be done. The contractors were informed of the cutting rules and these inspections were made to see that the contractors were complying.

In 1938, when the conservation program was first started, it was difficult to find any farmer or landowner who had any conception of such terms as improvement cutting, thinning, selective cutting and various other phrases in common use by foresters. Today it is a different story. There are many skeptics and many, even the majority, who still sell all their timber at one sale and leave little or no healthy growing stock, but they do know that there are other ways to cut timber, and a great many realize that from a long range standpoint they are making a mistake.

The wood procurement has increased its personnel of technical foresters, and at present have six. These men are stationed strategically over the territory. Any landowner who so desires can have his timber marked free of charge by a technical forester employed by the mill. These foresters will advise him as to the best methods to harvest his timber, and the marking and cutting will follow this plan. No accurate record has been kept as to acreage and cords cut under good forest management from privately owned lands, but it would total well over 150,000 acres.

Why does the Georgetown mill furnish this free service? Just ask Arch Donham, the wood superintendent for the mill, who should and probably does know more about wood procurement than most any man in the South. At least he had the job of keeping the largest mill in the world supplied with wood. He will tell you it's just plain good business. There are two things a paper mill must have to keep in wood: plenty of available raw material and public good will. If the landowners can be encouraged to grow more timber on a sound financial and forestry basis through judicious cutting and fire protection, assistance in their forestry problems from the buyer, then the whole industry, both the consumer and the producer, are on firm ground.

Too much praise cannot be given to the State Forest Service, Extension Service and other public agencies. The State Forest Service and Extension Service carry on active programs of assistance to landowners in analyzing their forestry problems, fire control, and offer service in marking timber. Both these services co-operate with the Georgetown mill and recommend numerous tracts of timber to be marked by foresters employed by the mill. Each year the mill gives a million free pine seedlings to farmers of South Carolina. This program is handled jointly by the Forest Service, Extension Service and the mill. The two State services take the order, allot the trees and furnish instructions in planting technique. The mill furnishes the trees and delivers them to each county seat in a company owned truck.

By no means has the mill's conservation program reached its goal. Most of the wood received is still cut under bad management; high prices and reduced personnel have also weakened the program during wartime. But a good start has been made and the ultimate goal is in sight.

Taken in the woods near Walterboro, S. C. (Photo by U. S. Forest Service.)

Loblolly pine stand, Chester County, S. C. Cut for International Paper Company.

Analyzing the Postwar Market

Market analyses are conducted for many purposes, including the preparation of forecasts, determination of market potentials, setting of quotas, measuring consumer acceptance, analyzing competition, and promoting better distribution by territories or customer classes.

The president of one large company listed the following basic questions which, he said, require an adequate answer if postwar planning is to be a success:

1. How will technical advancement brought on by the war effect competition within our own industry and with outside industries which are developing substitute materials?

2. How far have war controls, such as the concentration of industry, altered our selling position?

3. How can we arrive at probable changes in consumer and dealer buying habits?

4. What steps can be taken to anticipate the needs of our customers?

5. What are we doing to retain the good will of our customers?

6. Are we, as producers of primary goods, fully aware of the plans of potential users of our products?

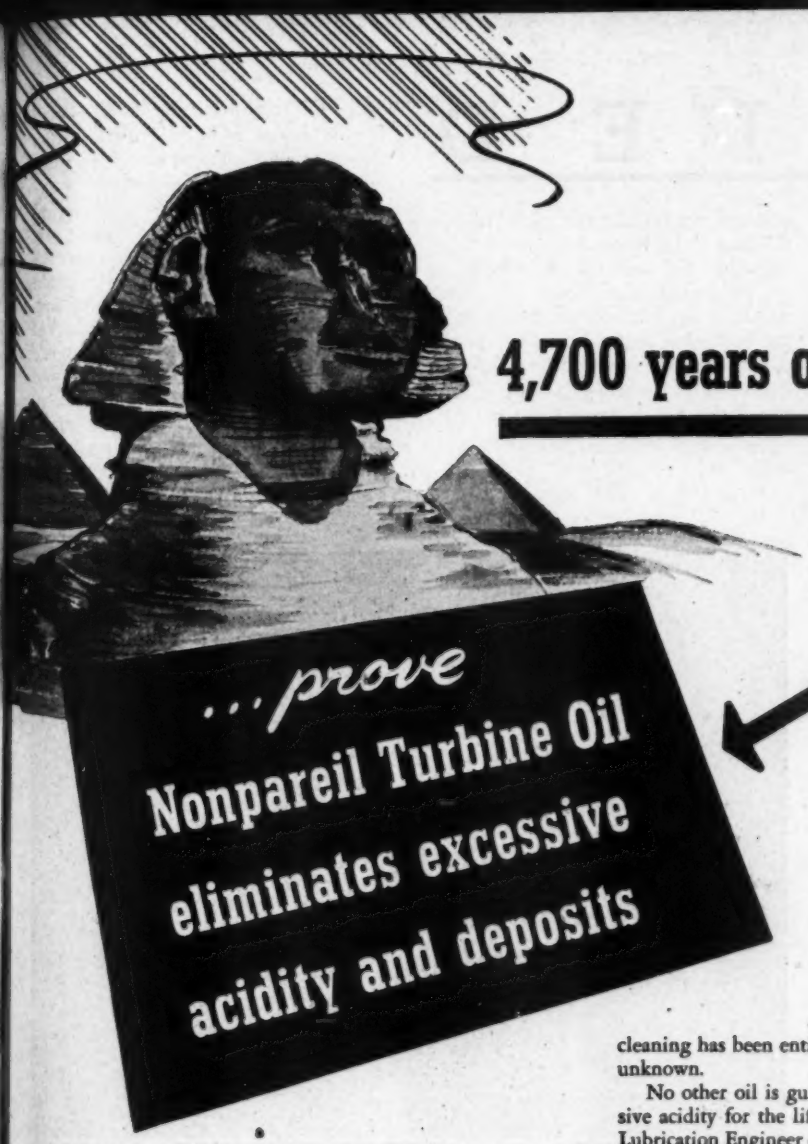
7. Should we consider new, or different, channels of distribution?

8. Can we arrive at an estimate of the quantity of our products which we can sell in the first, second, third year of the postwar period?

(*Planning Postwar Products and Markets, Policyholders Service Bureau, Metropolitan Life Insurance Company.*)

Paper SKETCHES . . . . . .

Theodoric-
FIRST GOTHIC KING OF ITALY, ABOLISHED A HEAVY CUSTOMS DUTY ON PAPYRUS IN THE LATE 400'S, THUS MAKING POSSIBLE A MUCH WIDER USE OF THE PRODUCT.
PAPER INSTEAD OF WOOD WAS USED BY GERMANS OF THE 1800'S IN THE MAKING OF THEIR PENCILS.
AS EARLY AS 1860, CALCINED CARD-BOARD WAS USED TO MAKE CARBON FILAMENTS FOR THE PIONEER INCANDESCENT ELECTRIC LAMPS MADE BY J. W. SWAN OF ENGLAND.
STATISTICS FOR 1943 INDICATE THAT STRAW WAS USED IN THE PRODUCTION OF PAPER AND PAPERBOARD BY MILLS IN NEW HAMPSHIRE, MASSACHUSETTS, NEW YORK, NEW JERSEY, PENNSYLVANIA, OHIO, INDIANA, ILLINOIS, MICHIGAN, MINNESOTA, IOWA, KANSAS AND CALIFORNIA. THE QUANTITY CONSUMED TOTALED 488,266 TONS.



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These records also show that the neutralization number of Nonpareil Turbine Oil seldom exceeds the extremely low limit of 0.10 mg. KOH/gm. (as determined by A.S.T.M. Method D 188-27 T). In many instances the neutralization number does not exceed 0.05 even after the oil has been in service 10 years or longer.

In addition, the original fill of Nonpareil Turbine Oil is still in operation in practically every case—even in the oldest installations. In these cases there has been no need for special treating or any sweetening of the oil, and turbine oil system cleaning has been entirely eliminated. Asphaltic deposits are unknown.

No other oil is guaranteed in writing not to form excessive acidity for the life of your turbine. Let a Standard Oil Lubrication Engineer explain this guarantee to you and point out what it means in lower turbine oil maintenance cost. Call the nearest local Standard Oil Company (Indiana) office, or write 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha 2.

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PENN SALT HOLDS DEDICATION OF ITS NEW LABORATORIES

Dedication ceremonies were held October 4 in the new Research Laboratories of the Pennsylvania Salt Manufacturing Company at Whitemarsh, Pennsylvania. The event was marked by a luncheon held in the Laboratories which was attended by prominent figures in the world of science, industry, publishing, and education.

The building housing the Laboratories has been converted from Whitemarsh Hall, stately mansion of the late Edward T. Stotesbury. By the utilization of an existing structure suitable for conversion, the Pennsylvania Salt Manufacturing Company saved time, building materials, labor, and expense in creating an effective group of laboratories to meet the needs of its expanding research and development progress. The extensive grounds of Whitemarsh will be maintained, inasmuch as they are famous for their magnificence, being known as the "Versailles of America."

The Pennsylvania Salt Manufacturing Company was founded in 1850 "for the manufacture of lye and the alkaline salts of soda." Today it is known as an important manufacturer of chlorine and other chemicals used in the pulp and paper industry. The new Laboratories include a complete pulp and paper manufacturing unit in the special laboratory devoted to paper chemicals under the direction of Thomas Toovey.

◆

EXECUTIVE CHANGES AT STANDARD OIL CO. (IND.)

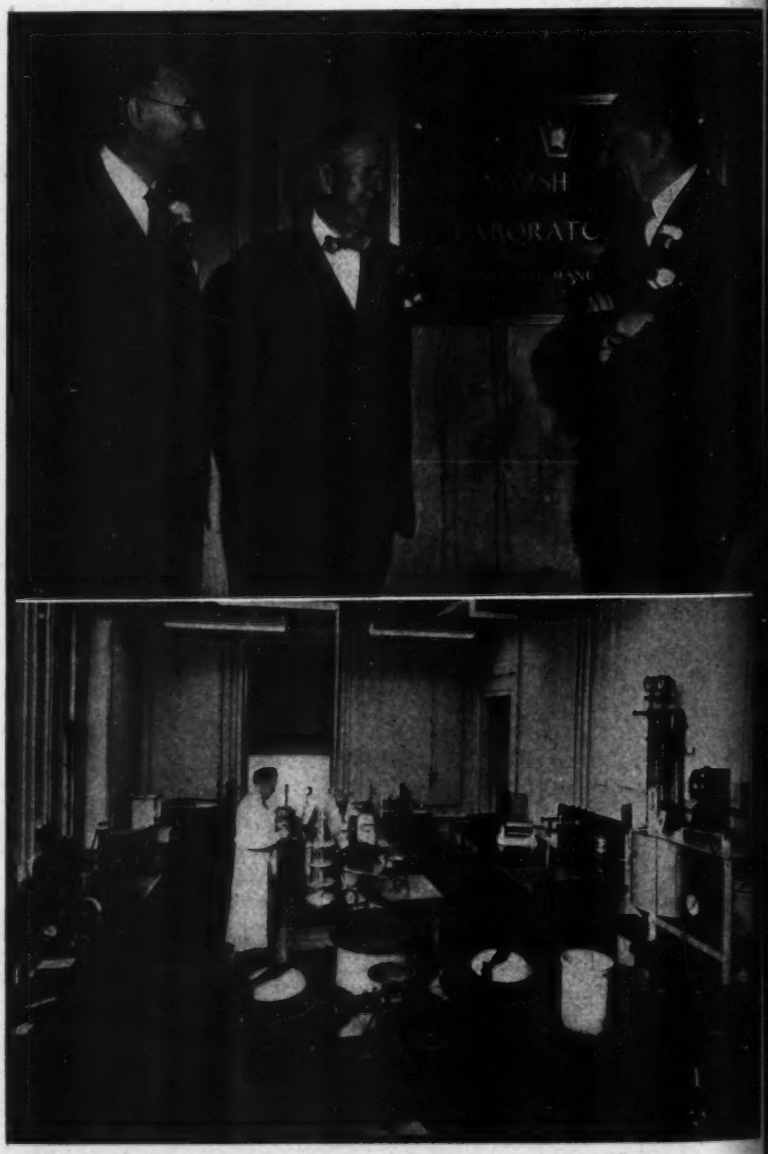
Several major changes in the top management of the Standard Oil Company of Indiana and its subsidiaries will become effective January 1, 1945.

On that date Edward G. Seubert will retire from the presidency after serving his company more than fifty-two years and heading it as chief executive more than fifteen. He will remain a director and become chairman of the executive committee of the board.

Robert E. Wilson, now president of Pan American Petroleum and Transport Company, will return to Chicago to become chairman of the board and chief executive officer of the Indiana company, and A. W. Peak, at present a vice president, will advance to the office of president. His place will be filled by F. O. Prior, now president of Stanolind Oil and Gas Company, an oil producing subsidiary. Mr. Prior will be a director and vice president of the Indiana company and will also be chairman of the board of the Stanolind Oil and Gas Company, Stanolind Pipe Line Company, and Stanolind Oil Purchasing Company as Mr. Peake has been.

Mr. Wilson will take over Mr. Seubert's responsibilities as chairman of the board of Pan American Petroleum and Transport Company, Standard's eastern subsidiary.

The reorganization is designed to relieve Mr. Seubert of the greater part of the responsibilities and burdens which he has carried and yet retain for the company the advantages of having his comprehensive knowledge of its affairs and his long experience readily available and his counsel and guidance a continuing factor in executive management. For him personally the change will top off a unique career that began only two years after the company was organized, saw him ad-



Above: (L to R)—Dr. S. C. Ogburn, Jr., manager of research and development and head of Whitemarsh Research Laboratories; Leonard T. Beale, president of Pennsylvania Salt Manufacturing Company, and C. F. Kettering, of General Motors, at dedication of the Laboratories. Below: Part of the pulp and paper section of the Laboratory.

THE DEGASIFICATION OF WATER

SINCE 1885 Cochrane engineers primarily have designed and applied equipment for the heating, degasification, and chemical treatment of boiler feed water. Naturally, in more than fifty years of such activity, problems were encountered requiring equipment to condition and degasify waters of unusual physical and chemical characteristics. For example, feed water deaerating equipment to operate at pressures ranging from sub atmospheric to over 125 lbs. per sq. in. has been designed and installed. Equipment for deaerating cold water at temperatures as low as 35 deg. F., and other equipment for removing carbon dioxide, hydrogen sulphide and ammonia have been furnished in large as well as in relatively small capacities.

The problem of removing dissolved gases from water may be quite complex, as coordinating a design and determining a guaranteed performance involves a thorough analysis of temperatures, gas pressures, viscosities, ionization, division of water and vent rates. An apparatus designed to remove oxygen to "zero content" is quite inadequate for removing a small quantity of ammonia. Likewise, a decarbonator designed to remove large quantities of carbon dioxide may not be suited to remove hydrogen sulphide.

Knowledge of these factors and their relative importance in the design of degasification apparatus is a part of Cochrane experience and is supported by tests and data from actual installations, placing us in a position to quote on equipments for degasifying water irrespective of their size.

Outstanding Cochrane equipments vary in size from 1000 lbs./hr. to 45,000,000 lbs./hr., indicating the broad coverage of Cochrane experience.

The purpose of this bulletin is to point out briefly some of the problems of degasification and to indicate generally the equipment used in the solution of these problems.

[1]

A NEW PUBLICATION YOU WILL WANT TO EXAMINE

The booklet shown on the right, from which the above page is taken, describes concisely many pieces of equipment designed and manufactured by Cochrane for the removal of Ammonia, Carbon Dioxide, Hydrogen Sulphide, Oxygen and other gases from Process and Boiler Feed Water. Write for a copy mentioning any specific water problem in which you may be interested.

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vance from a mechanic's helper to a seat on the board and officer's status in 1919, and put him in the presidency in 1927, and made him chief executive in 1929. He has been president of Standard of Indiana longer than any predecessor.

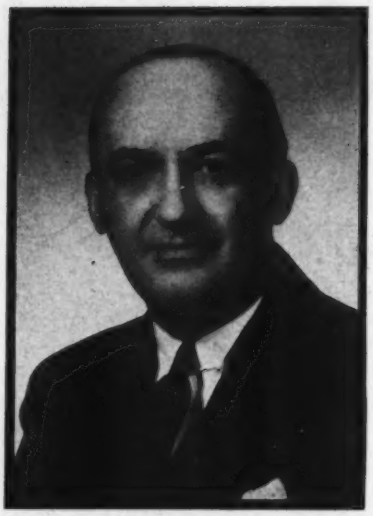
◆

HARRIS-SEYBOLD-POTTER ACQUIRES CHARLES N. STEVENS CO., CHICAGO

Harris - Seybold - Potter Company, Cleveland, manufacturers of graphic arts machinery, and the Charles N. Stevens Company, Chicago, dealers in bindery equipment, jointly announce the purchase of the Stevens Company by Harris-Seybold-Potter.

Charles N. Stevens, who is 75 years of age and has retired from active business, handled the sale of Seybold equipment in Middle Western states for 44 years. For 21 years, he was branch manager for Seybold, and since 1921 has been head of his own company which has held the Seybold franchise. Since it was established in 1921, the Stevens Company has been located in the Rand-McNally Building, Chicago.

The personnel of the Stevens Company will be retained by the Harris-Seybold management. The office staff



Glen D. Baber

will be under the direction of Mrs. Benson. The service organization and H. Peterson, mechanical superintendent who has been with Stevens for 35 years, will continue under the new management. The sales force, which is experienced and competent in meeting the needs of the market, also will remain with the new management.

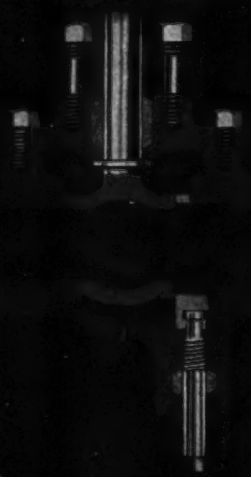
Glen D. Baber, assistant sales manager of Seybold, will be transferred from the executive offices, in Cleveland, to Chicago to manage the Seybold operations. Mr. Baber has been with Seybold for over twenty years, and has had broad experience covering all phases of the company's sales and service operations. He has traveled extensively throughout the United States and Canada, and is thoroughly conversant with Seybold products and markets.

The Harris-Seybold-Potter Company, which is now converted to the manufacture of war goods, represents the consolidation of leading graphic arts machinery companies merged by R. V. Mitchell, company president, in 1927. The Harris Division builds lithographic and rotary printing presses. The Seybold Division manufactures Seybold cutters, Morrison stitchers and Wright drills. Both Harris and Seybold have been responsible for major developments of outstanding importance in their fields of press manufacture, paper cutting and bindery equipment.

The purchase of the Stevens Company is the third Harris-Seybold-Potter Company move within recent weeks in the furtherance of the plans of the company for postwar operations in this country and in export. Recently announced was the integration of the

FAIRBANKS SPHERO VALVES

End Blow-off Troubles



When a full-flow, quick-acting valve is required, specify "Fairbanks Sphero" patented valve.

Instead of the usual wedge or disc, a revolving ball is used which cuts through solids and liquids and wipes the seating surface clean. Can be opened or closed with a quarter turn of the lever handle.

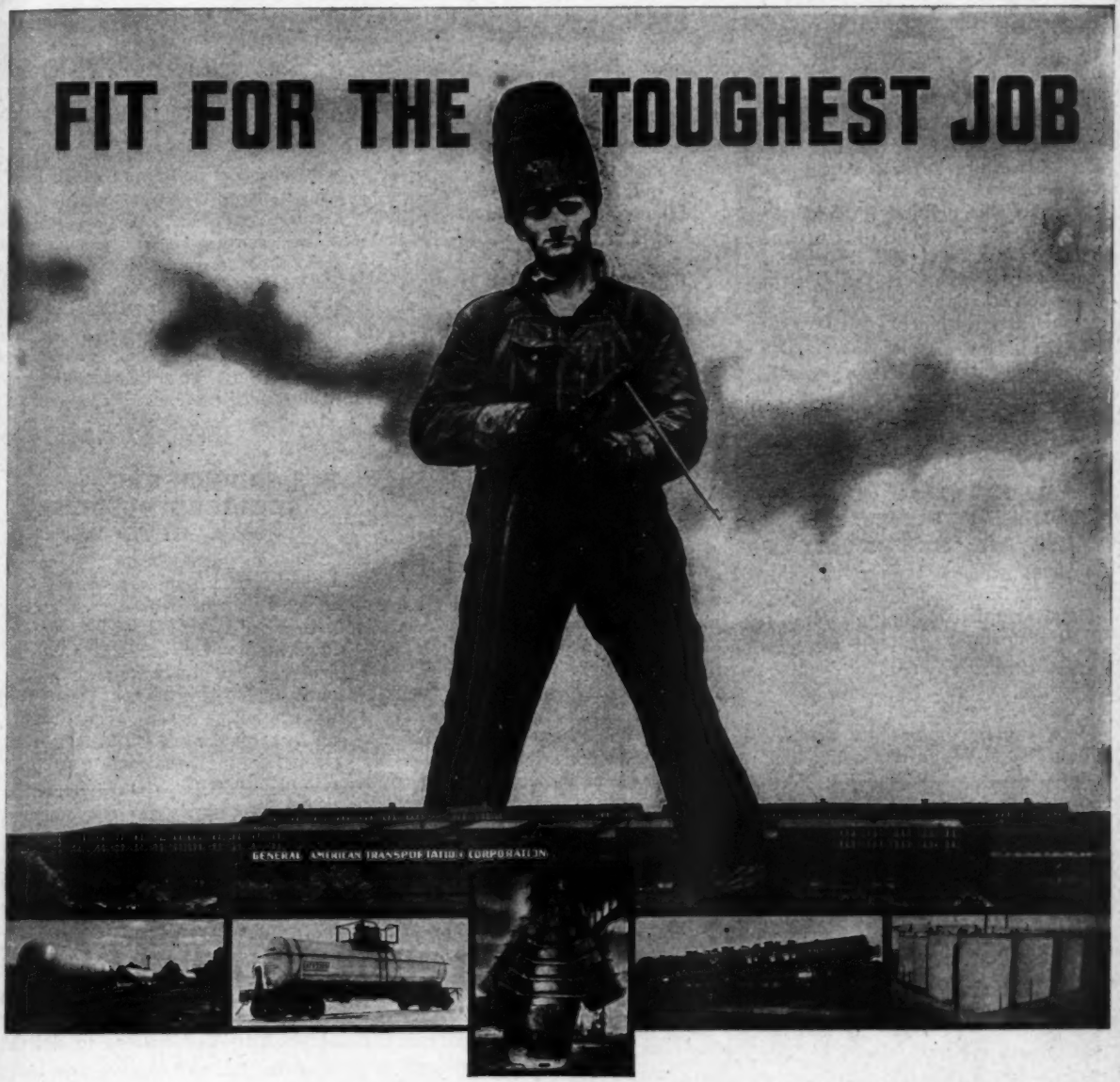
Write for Catalog No. 42 and name of our nearest distributor.

THE FAIRBANKS COMPANY

393 LAFAYETTE STREET NEW YORK 3, N. Y.

520 Atlantic Ave., Boston 10, Mass. • 15 Ferry St., Pittsburgh, Pa.

FIT FOR THE TOUGHEST JOB



At our Sharon plant, tough jobs are tackled with enthusiasm. If GATX can be said to have a specialty, it is doing the difficult. And doing it by the well-known General American standard: EVERY piece of equipment that leaves our plant is *better than it has to be.* Planned and built and tested to meet *more* than maximum operating demands, GATX products can mean extra safety and extra production economies in *your* plant.

GENERAL AMERICAN TRANSPORTATION CORPORATION

GATX GENERAL AMERICAN PLATE & WELDING DIVISION PLANT AT SHARON, PA.

Plate & Welding Division — Sharon, Pennsylvania

Specialists in plate fabrication — manufacturers of pressure vessels of steel, alloys and aluminum—all classes of welding — process equipment of all types—chemical engineering laboratories and service—completely equipped field erection department.

sales organizations of the Harris and Seybold Divisions under H. A. Porter, vice president in charge of sales. With this program, J. C. Dabney, sales manager of the Seybold Division, was appointed assistant manager of sales.

The establishment of the company's Used Machinery Division in Chicago was a previous move in the expansion program. This division is under the management of Ren R. Perry, who has been connected with Harris for many years. It provides facilities for the reconditioning and sale of used graphic arts machinery.

All Chicago, operations of Harris-Seybold-Potter are under the management of William Guy Martin, vice president in charge of the Western District, with offices in the Fisher Building.

◆

CANDLES FOR CIVILIAN USE ARE DISCONTINUED

Along with a scarcity of other Christmas trimmings, the Standard Oil Company of Indiana has revealed that it is temporarily discontinuing production of many candles for civilian use.

This will enable the company to divert wax and trained manpower to filling increased government orders. It is explained that the armed forces use a great many candles. These provide light at night in areas where no other light is available. In small tents where it is impossible to light fires and there are no stoves, candles are used to heat food. Candle drippings also plug worn spots in leaky tents and melted candle wax forms a waterproof coating over articles which must be protected from the elements.

◆

WESTINGHOUSE FORMS EDUCATIONAL DEPT.

A new educational department has been announced by the Westinghouse Electric and Manufacturing Company, Pittsburgh, Pennsylvania. This new department will co-ordinate all of the company's relations with schools, colleges and universities. It will be located in Pittsburgh and will have three main divisions:

1) School Service — This division will provide teaching aids and science information to all schools and educational institutions up to and through the high school level. Charles W. MacLean, present manager of the division, will continue in that position.

2) University Relations — This division will maintain close contact with colleges and universities, administer the company's numerous scholarships and fellowships and supervise the recruiting of graduate student employees. Howard C. Madsen has been named manager.

3) Student Training—This division will supervise the training of all graduate students for engineering, manufacturing, sales, and other departments of the company. It will be supervised by O. D. Montgomery as manager.

In announcing this new department, the company states that the company is offering annually more than $40,000 in 61 scholarships to the nation's high school seniors. This includes 40 scholarships awarded each year in the Science Talent Search.

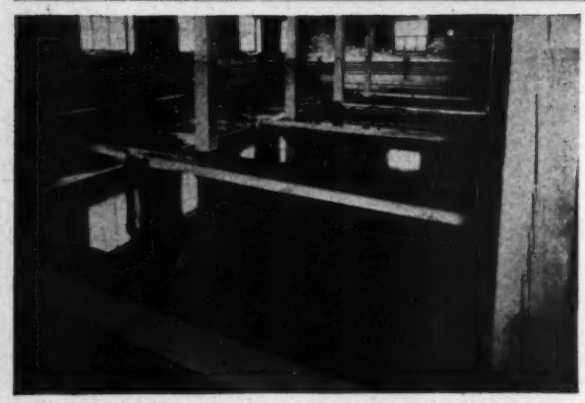
◆

U. S. RUBBER HAS ACQUIRED BUSINESS OF L. H. GILMER CO.

Announcement is made that the United States Rubber Company has agreed to purchase the assets and business of the L. H. Gilmer Company of Philadelphia. Herbert E. Smith, president of U. S. Rubber, stated that the purchase was made to round out further the mechanical goods division of that company. He said that no change in the management or oper-

How to Get Better Process Water

You Get CLEANER WATER And DEPENDABLE SERVICE With NORWOOD FILTERS



The Norwood Filters at Fox River's Telulah Mill were installed nearly a quarter of a century ago. Still giving dependable service.

YOU can depend on Norwood Filters to deliver cleaner process water . . . and to give you long, trouble-free service . . . because these good filters embody every modern advantage for better water processing. Norwood Filters remove all natural impurities. You get cleaner process water . . . you get a cleaner sheet, free from spots and specks. Investigate Norwood Filters today.

Plan Now for Reconversion

Be Ready to change back to peacetime production by planning now. Write for Norwood Engineering Data Units on either Filters or Calenders. Send for them today.

The NORWOOD ENGINEERING COMPANY

16 No. Maple St., Florence, Mass.

Get a Good Start And a Good Finish With NORWOOD WATER FILTERS AND PAPER FINISHING MACHINERY

TITANOX Pigments have "Crossed Many Rivers"
Assurance of the great contributions which TITANOX pigments will make to the post-war paper program, is doubly given: first in the fact that these modern pigments have helped to solve so many problems of opacity, whiteness and brightness in the past, and second that their makers are constantly improving TITANOX pigments in the light of experience, and devising newer techniques for their application.
In the quarter century since the Titanium Pigment Corporation pioneered the development and commercial use of titanium pigments "many rivers have been crossed". The unexcelled opacity, whiteness and brightness of TITANOX are universally accepted. So too are their permanence of color, high tinting strength, fine particle size, purity, chemical stability — and all the benefits which are derived from these qualities.
What lies beyond is under continuing investigation in the TITANOX laboratories where the objective is to make TITANOX pigments of still greater help to the Paper Industry.
TITANOX
REG. U.S. PAT. OFF.
TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York 6, New York • 104 South Michigan Avenue, Chicago 3, Illinois
350 Townsend Street, San Francisco 7, Calif.
2472 Enterprise Street, Los Angeles 21, Calif.
TITANOX
REG. U.S. PAT. OFF.

American Pioneers

The original Edison Talking Machine was invented in 1877. Tinfoil was used as the material which received the recordings. The cylinder was operated by hand.

TIMES have changed since the phonograph first appeared. Materials used for making records have also altered. Wax cylinders succeeded those covered with tinfoil. Circular, rubber composition disks displaced wax cylinders for permanent recordings. More recently these have been supplemented with disks made of paperboard.

Paper and paperboard are now being successfully substituted for numerous other materials, but papermaking is still dependent on well designed woolen felts. There is apparently no satisfactory substitute for papermakers' felts, and few good substitutes for **DRAPER'S.**

Draper Felts For Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

L. H. BREYFOGLE, Kalamazoo, Mich.
CHAS. E. BERTSCHY, Milwaukee, Wis.
W. L. CAMPBELL, Savannah, Ga.
RALPH E. BRIGGS, Canton, Mass.
E. R. LELOFF, Vancouver, Wash.
WILLIAM N. CONNOR, Canton, Mass.

ations of the Gilmer company is contemplated. John S. Krauss, president, will continue in the active management of this business.

The Gilmer company was founded in 1907 and employs approximately 600 people. Besides V-belts, it manufactures such products as automobile fan belts, rubber covered rolls, and industrial truck wheels, and other related items.

◆

STANDARD OIL (IND.) WILL AWARD SERVICE PINS TO 511 EMPLOYEES

Before the end of 1944, the Standard Oil Company of Indiana will award pins in recognition of 10 to 40 years of service to 511 employees with a total of 9,160 years of service.

Diamond-set pins will be presented to seven employees for 40 years of service each, while gold pins will be given to 81 employees for 30 years of service each, 222 employees for 20 years, and 201 employees for 10 years.

The company instituted the service pin in 1914 in recognition of 20 years or more of service and in 1922 adopted the present pins for 10, 20, 30, and 40 years of service.

◆

▶▶▶ THE PROGRESS OF five synthetic rubber pilot plants, now under construction by Blaw-Knox Company, designers and engineer-contractors of the quintuple project, indicates that these plants will be completed early next year. Plants are being built for Firestone Tire & Rubber Company, Akron, Ohio; Goodyear Tire & Rubber Company, Akron; U. S. Rubber Company, Naugatuck, Connecticut; Copolymer Corporation, Baton Rouge, Louisiana; and National Synthetic Rubber Company, Louisville, Kentucky.

ARMY-NAVY "E" AWARDS

Third Star: The Army-Navy "E" flag which flies over the plant of Shartle Bros. Machine Company, Middletown, Ohio, now displays three stars. The company has just received its fourth citation for continued excellence of service in war production.

Third Star: The Hammermill Paper Company, Erie, Pennsylvania, has been awarded its third white star. Hammermill was the first paper mill company to be awarded the "E" pennant.

To give the finest and the longest service Appleton Super-Calender Rolls are built to fit the individual requirements of each finishing application. Our selection of fillings covers the complete range from soft cotton to the hardest paper rolls and includes the New-Process Fillings developed by us to give outstanding performance on coated and clay-filled stocks. Workmanship and materials are the best that years of experience and research can produce. Our high manufacturing standards grow more and more exacting as we take advantage of every technical advancement that improves the quality of our filled rolls.

APPLETON
SUPER • CALENDER ROLLS

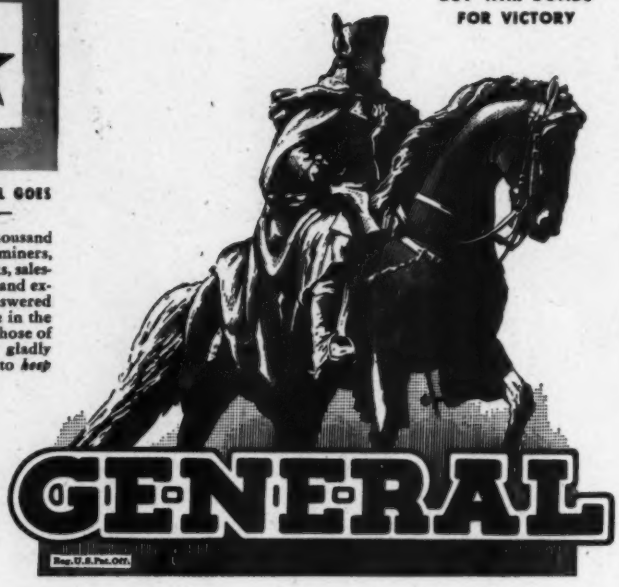
THE APPLETON MACHINE COMPANY, Appleton, Wisconsin

Eastern Sales Representatives: CASTLE & OVERTON, INC., 630 Fifth Avenue, New York

GENERAL COAL GOES TO WAR—

More than a thousand of our men—miners, machinists, clerks, salesmen, engineers and executives have answered the call to serve in the armed forces. Those of us left behind gladly "Close Ranks" to *keep the coal rolling.*

BUY WAR BONDS FOR VICTORY



GENERAL

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RODA High grade gas, by-product and steam coal from Wise County, Va., on the Interstate Railroad.

DENDRON High grade gas, by-product, steam and domestic coal from Wise County, Va., on the Interstate Railroad.

STONEGA High grade, high volatile steam and by-product coal from Wise County, Va., on the Interstate Railroad.

PREMIX A laboratory controlled product blended to meet exacting stoker requirements. From Wise County, Va., on the Interstate Railroad.

COKE Roda and Stonega from Wise County, Va., and Connellsville Coke from Pennsylvania.

CRITERION COAL High grade gas, by-product, steam and domestic coal—Pittsburgh seam from Irwin Basin, Westmoreland County, Pennsylvania, on the Penna. Railroad.

CROZER Genuine Third Vein Pocahontas from McDowell County, W. Va., on the Norfolk & Western Railroad.

Admiralty Coal Genuine New River Smokeless, Beckley or Sewell seam from Raleigh County, W. Va., C. & O. and Virginian Railroads.

Old Kentucky Hazard No. 4 and No. 7 steam and domestic coal from Wiscoal, Knott County, Kentucky, on the L. & N. Railroad.

GENCO Steam and domestic coals from a number of producing districts.

ANTHRACITE—Hazle Brook Premium . . . Raven Run

Our personnel with the experience gained through long and varied marketing activity assures proper application of one of the above brands and effective servicing of any fuel requirement.

General Coal Company

123 SOUTH BROAD STREET **PHILADELPHIA, PA.**

BRANCHES:

BLUEFIELD, W. VA. BOSTON BUFFALO CHARLESTON CHARLOTTE, N. C.
CINCINNATI DETROIT NEW YORK NORFOLK PITTSBURGH

SAFETY SCORES

▶▶▶ THIRTY-SIX MILLS finished the first three months of the 1944-45 Paper Industry Safety Contest with a perfect record. The following list shows returns for the first three months of the new contest which began June 30, 1944.

Division I— Pulp and Paper Mills

Group A

The Flintkote Co. (Pioneer Div.), Los Angeles, Calif.
Price Bros. & Co., Ltd., Riverbend, P. Q.

Group B

Kimberly-Clark Corp. (Niagara Mill), Niagara, Wis.
Mersey Paper Co., Ltd., Liverpool, Queens Co., N.S.
*Crown Zellerbach Corp. (Washington Pulp & Paper Corp. Div.), Port Angelus, Wash.

Group C

Container Corp. of America, Carthage, Ind.
Esleeck Manufacturing Co., Turners Falls, Mass.
*Southern Kraft Div of International Paper Co., New Haven, Pa.

Group D

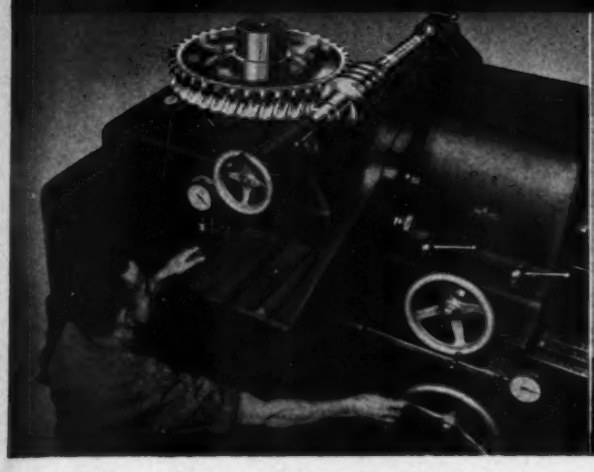
Crown Zellerbach Corp. (Crown Willamette Paper Co. Div.).
Strathmore Paper Co. (Woronoco Mill No. 2), West Springfield, Mass.
Marathon Corp. (Ashland Div.).
Central Fibre Products Co., Vincennes, Ind.
Ward Paper Co., Merrill, Wis.
Latex Fiber Industries, Inc., Beaver Falls, N. Y.
Rogers Fibre Co., Inc., Bar Falls, Maine.
Certain-teed Products Corp., Buffalo.
Strathmore Paper Co. (Woronoco Mill No. 1), West Springfield, Mass.
Central Fibre Products Co., Denver.
*Spaulding Fibre Co., Inc. (Milton Plant), North Rochester, N. H.
E. I. du Pont de Nemours & Co., Newhall, Wilmington, Del.
*Spaulding Fibre Co., Inc. (Hayes Plant), Rochester, N. H.

Division II—Paper and Board Remanufacturing

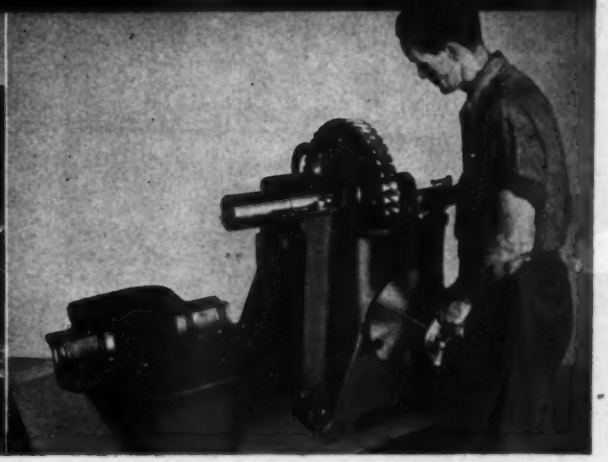
The Flintkote Co., Chicago Heights Plant, Ill.
Bird & Sons, Inc. (Roofing Plant), Norwood, Mass.
Container Corp. of America, Cleveland.
A. Geo. Schulz Co., Milwaukee, Wis.
Ft. Wayne Corr. Paper Co., Hartford City, Ind.
Lanzit Corrugated Box Co., Chicago.
Ft. Wayne Corr. Paper Co., Chicago.
Bird & Son, Inc. (Roofing Plant), Shreveport, La.
Bird & Son, Inc. (Roofing Plant), Chicago.
Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.
Iowa Fiber Box Co., Keokuk, Iowa.
South West Box Co., Fort Worth, Texas.
International Cellucotton Products Co., Memphis, Tenn.
Kimberly-Clark Corp. (Atlas Mill), Appleton, Wis.
Bay West Paper Co., Green Bay, Wis.

(*) Less than three months' experience reported.

CHECKED for TOOTH CONTACT



1.—Checking tooth contact with worm and gear located at exact center distances, checked to within 1/10,000th of an inch.



2.—Checking tooth contact by means of "bearing blue" after assembly.

BOTH *BEFORE and AFTER* ASSEMBLY

Before assembly, every De Laval Worm Gear is tested on the machine shown at the left, in which it is accurately mounted with the center line of the gear and the center line of the worm correctly spaced and at true right angles. Under these conditions the tooth contact is observed and the back lash accurately measured.

After assembly in the gear case, tooth contact is re-checked by means of bearing blue to assure correct adjustment. Such checking and holding center distances within close limits assures satisfactory operation of De Laval Worm Gear Speed Reducers, and facilitates installation when De Laval Worm and Gear sets are purchased for use in other machinery.

Specifications alone do not make a worm gear.

1147

TURBINES • HELICAL GEARS and WORM GEAR SPEED REDUCERS CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

WORM GEAR DIVISION

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA • BOSTON • CHARLOTTE • CHICAGO • CLEVELAND • DENVER • DETROIT • DULUTH • EDMONTON • GREAT FALLS • HAVANA • HELENA • HOUSTON • KANSAS CITY • LOS ANGELES • MONTREAL • NEW ORLEANS • NEW YORK • PHILADELPHIA • PITTSBURGH • ROCHESTER • ST. PAUL • SALT LAKE CITY • SAN FRANCISCO • SEATTLE • TORONTO • TULSA • VANCOUVER • WASHINGTON, D. C. • WINNIPEG

ASSOCIATIONS

CHICAGO PRO PAPER GROUP ELECTS OFFICERS

The second regular monthly meeting of the 1944-45 season of the Chicago Professional Paper Group was held during the evening of October 16, 1944 at the Chicago Bar Association.

At this meeting, the names of the new officers for the present season, elected by mail ballot, were announced and these officers were installed. At the same time, all various committee members were appointed.

The officers include the following:

President—Harry E. Weston, Fritz Publications, Inc.

Vice President—F. D. Long, Container Corp. of America.

Treasurer—Arnold McAneny, Bradner Smith & Company.

Secretary—V. V. Vallandigham, Kelco Company.

The chairmen of the several committees follow:

Program—J. L. Kubicka, Container Corp. of America.

Announcements—F. D. Long, Container Corp. of America.

Arrangements—W. M. Bain, Glidden Company.

Harold Alley, past president, is retained as an *ex officio* member of the Executive Committee.

In addition to the installation of new officers, Peter J. Massey, of the H. P. Smith Paper Company, of Chicago, presented an extremely interesting and fundamental paper on "Machine Coated Papers." This paper is published in its entirety elsewhere in this issue. Numerous questions followed the presentation of the paper by Mr. Massey. These questions indicated very definitely the interest in the subject and the desire of those in attendance for added information.

Attendance at the meeting approximated 125.

HURRICANE DID NOT "BLOW DOWN" TAPPI COMMITTEE MEETING

Hurricanes may blow down pulpwood, but they cannot "blow down" those whose business it is to turn that pulpwood into pulp. This was demonstrated at the meeting of Alkaline Pulping and the By-Products committees of TAPPI, which met at Savannah, Georgia October 18-19-20. The hurricane struck the second day of the meeting, but committee sessions were uninterrupted. The only change caused by the storm was an abbreviation of the inspection tour to the Savannah plant of the Union Bag & Paper Corporation, the Herty Laboratory, and the cancellation of the "Georgia Barbecue," which was to have been served in the open.

The committees held their sessions at the Hotel SeSoto, where the first meeting of TAPPI to convene in the South, was held several years ago.

The two committees met together, so as to give those in attendance an opportunity to hear all talks and discussions.

A highlight of the meeting was the address by Dr. E. C. Jahn, of the New York State College of Forestry, who recently visited Sweden and made an extended study of the pulping industry in that country. He spoke at the banquet on Thursday evening which was attended by more than a hundred committee members and invited guests.

A similar meeting of the two committees is scheduled for New Orleans to be held at a date to be set next spring.

Single Motors OR Complete Power Plants!

GENERATORS
AC & DC MOTORS
AIR COMPRESSORS
MOTOR GENERATOR SETS
TURBO GENERATOR SETS
TRANSFORMERS
SWITCHBOARDS
REPAIRING
REBUILDING
RENTALS

★

CHICAGO ELECTRIC CO.
1318 W. 22ND STREET
CHICAGO 8, ILLINOIS

The banquet of the TAPPI Committee meeting in Savannah, Georgia, was well attended in spite of the hurricane.

THE RIGHT COMBINATION FOR TOPS IN EFFICIENCY

THE RIGHT COMBINATION offers an immediate answer to highest efficiency and low costs in the movement of materials.

The "AUTOMATIC" TRANSPORTER for horizontal movement of many more tons of material per load than by conventional methods, from receiving, to process, to storage, to shipping ...and the "AUTOMATIC" Tiering Fork Truck for stacking of pallet loads, give you a modern handling system to make possible numerous daily and valuable benefits.

You lower handling costs — you do each job speedily to effect valuable time savings — you inject cost savings all along the production line — you get dependable insurance against breakage — you add safety to production—you conserve much needed floor space through high, orderly stacks which are always easily accessible.

NO STRAINING ...TUGGING...PULLING Nor PUSHING with the "AUTOMATIC" TRANSPORTER

POSITIVE MECHANICAL BRAKE • CONTROLS IN STEERING HANDLE • FORWARD AND REVERSE SPEEDS • FRONT WHEEL POWER DRIVE • SHOCKLESS HYDRAULIC PLATFORM LIFT WITH EASY FOOT CONTROL • "DEAD-MAN" CONTROL

USE THE COUPON

AUTOMATIC TRANSPORTATION CO.
113 West 87th Street, Chicago 20, Illinois

Gentlemen: Please send details on the employment of this truck combination for materials handling.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

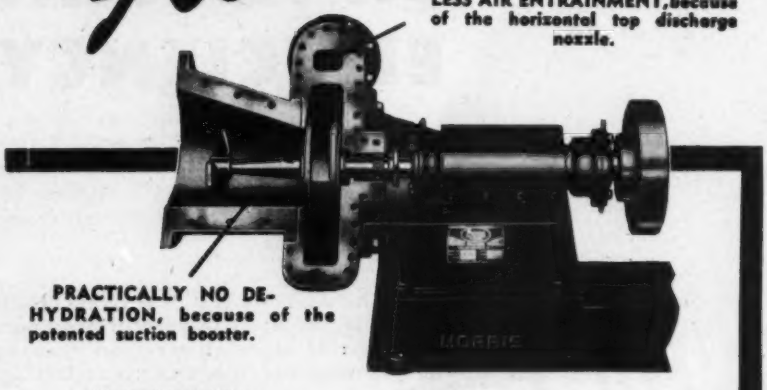
AUTOMATIC TRANSPORTATION COMPANY

DIV. OF THE YALE & TOWNE MFG. CO.

113 W. 87th STREET CHICAGO 20, ILLINOIS

MANUFACTURERS FOR OVER 35 YEARS *Electric Propelled* INDUSTRIAL LIFT TRUCKS

UNIFORM *Flow...*


LESS AIR ENTRAINMENT, because of the horizontal top discharge nozzle.
PRACTICALLY NO DE-HYDRATION, because of the patented suction booster.

WITH THE

MORRIS

Type ST-P STOCK PUMP

Uniform flow—the prime essential in a stock pump—is assured by two special features of the Morris Type ST-P Stock Pump.

Even when handling high consistency stock, there is very little tendency for the Morris impeller to extract the water from the stock and leave the dehydrated paper fibre to clog the intake pipe. That's because the patented suction booster mechanically agitates and propels the fibre into the suction eye of the impeller. A continuous and uniform flow of the stock is set up.

Where foaming stocks are encountered, or stocks that contain large amounts of entrained air, the horizontal top discharge—plus the action of the suction booster—speeds the escape of air from the pump and prevents air blocks from forming in the eye of the impeller.

Write Today... for Bulletin 176, giving sizes and capacities and listing many special features and advantages, including those suggested by superintendents in a number of different mills.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.

Builder of Centrifugal Pumps, Hydraulic Dredges and Steam Engines Since 1864. Branch Offices in Principal Cities.

MORRIS CENTRIFUGAL PUMPS

WIDE INTEREST SHOWN IN BOLTON AWARD

There is a widespread interest among paper mill men in the Bolton Award Contest which is sponsored by John W. Bolton & Sons, Inc., Lawrence, Massachusetts, and conducted by the American Pulp and Paper Mill Superintendents Association. More than 2,000 folders containing rules of the contest have been sent out, many of these on special request. Mill managers throughout the country have taken a special interest in the contest and some mills have held meetings of their superintendents and foremen to explain these rules.

A beater engineer recently made the following inquiry of G. W. Craigie, secretary-treasurer of the Superintendents Association, who is handling the contest:

"I am interested in your Bolton Award and am wondering if I am eligible to send in a brief. I am a Beater Engineer and would like to enter my version in hopes of creating more harmony and better relations between employee and employer."

Mr. Craigie replied as follows:

"We want to make this contest as helpful to both workers and management as it can be made and your ideas will be most welcome."

This reply may be of interest to other paper mill men not in supervisory positions who may wish to enter the contest.

Mr. Craigie reports that articles are already being received and that divisional and national judges will soon be appointed.

◆

CONVENTIONS AND COMING EVENTS

November 15-19—National Chemical Exposition at the Coliseum, Chicago.

November 27-December 2—The 16th National Power Show and Mechanical Exposition, Madison Square Garden, New York City.

STATED MEETINGS

Technical Associations of the Pulp and Paper Industry

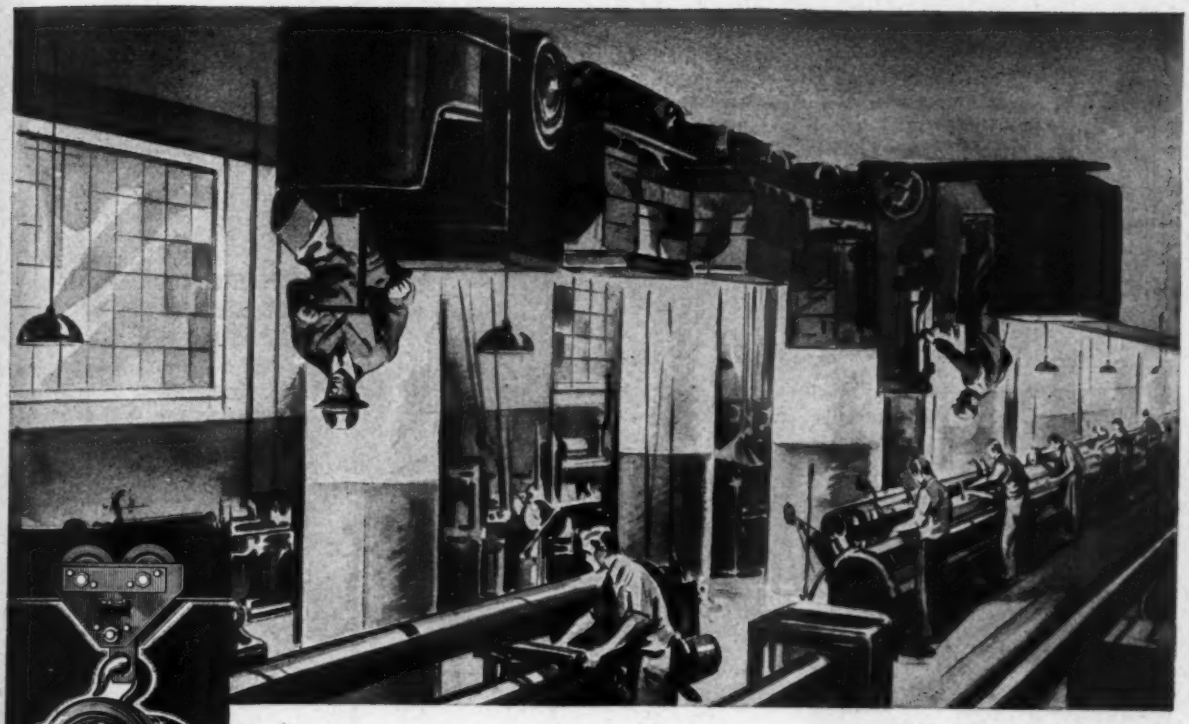
Delaware Valley Section—First Friday of each month at the Engineers' Club, Philadelphia, Pa.

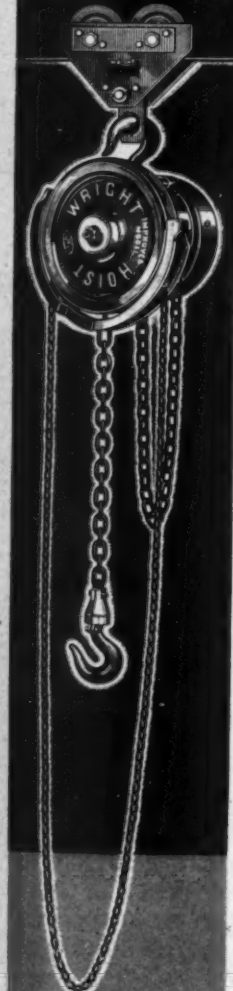
Kalamazoo Valley Section—First Thursday of each month, including June, at 6:30 P. M. at the Columbia Hotel, Kalamazoo, Mich.

Lake States Section—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Chicago Professional Paper Group

Third Monday of each month at Chicago Bar Association, Chicago.





CAPACITY
¼ TO 40
TONS

Wright

gives the one-story shop two production floors

WRIGHT HOISTS and **CRANES** can make your idle ceiling help speed production. From their long years of accumulated experience, **WRIGHT** engineers can suggest ways to use your overhead space so that a one-story shop virtually has two production floors. **WRIGHT** Improved High Speed Hoists, **WRIGHT** Speedway Electric Hoists, and the famous **WRIGHT** Cranes have long made possible fast, safe, economical transportation of materials. • Your local **WRIGHT** distributor is well qualified to suggest methods for both speeding production and saving money. You will find him listed in your metropolitan classified telephone directory. You can depend upon him. If your problem is special, ask your distributor to call a **WRIGHT** engineer, who has had years of experience in solving all manner of material handling problems.

WRIGHT MANUFACTURING DIVISION
York, Pa., Chicago, Denver, Los Angeles, New York,
Portland, San Francisco

AMERICAN CHAIN & CABLE COMPANY, INC.
BRIDGEPORT • CONNECTICUT

In Business for Your Safety

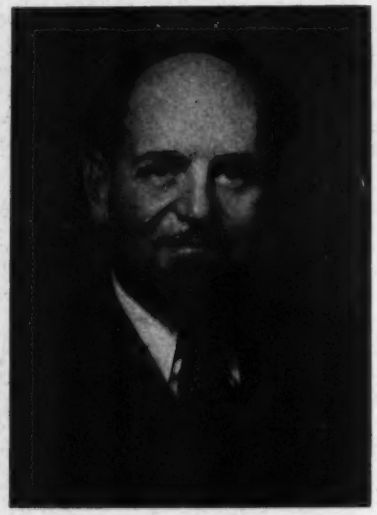
WRIGHT *Improved High Speed* **HOISTS**

NAMES *in the* NEWS

Personals

GEN. AMERICAN PROC. APPOINTS DR. GUTZEIT DIRECTOR OF RESEARCH

The appointment of Dr. Gutzeit, D. Sc., as research director has been announced by General American Process Equipment, Louisville, Kentucky, a division of the General American Transportation Corporation.



Dr. Gutzeit

Dr. Gutzeit has done extensive work in metallurgical research. He has had unusually varied experience in the chemical industry, ranging from pharmaceutical manufacture to electrometallurgy.

In 1941, Dr. Gutzeit came to this country from Switzerland, where he held a professorship at the University of Geneva. After coming to this country, he became associated with the Dorr Company. In Europe he also acted as consultant to a number of governments and private industries on chemical and metallurgical problems.

◆

MATHIESON TRANSFERS RUSSELL & WOODSIDE TO NIAGARA FALLS

L. E. Russell and Vernon Woodside, of the Sales Development and Technical Service Department of The Mathieson Alkali Works, have been transferred to the Niagara Falls laboratories of the company. Mr. Woodside,

L. E. Russell

who has been serving the pulp and paper industry in the southeastern district, is now specializing in technical service to the entire pulp and paper industry. Mr. Russell, who held a similar position in the western district, is now engaged in market survey work on new Mathieson products.

Mr. Woodside joined the Mathieson organization in 1936. His previous affiliations include the International Paper Company, Foster Paper Company, Oswego Falls Corporation, and Dexter Sulphite Pulp and Paper Company. He is a graduate of the New York State College of Forestry.

Mr. Russell also is a graduate of the New York State College of Forestry. Upon his graduation, in 1938, he was employed by the St. Regis Paper Company, until he went to the Mathieson company in 1941.

Vernon Woodside

◆

HENRIK EKLUND NOW CHIEF ENGINEER WITH D. J. MURRAY MFG. CO.

From the D. J. Murray Manufacturing Company, Wausau, Wisconsin, comes an announcement that Henrik J. Eklund has been appointed chief engineer. Since 1933, Mr. Eklund has

Henrik Eklund

been associated with the designing and development of paper and pulp mill machinery both in the United States and Finland. He is a graduate of the Polytechnic Institute of Finland in mechanical engineering with a Master's degree. Since coming to the States in 1936, he has been associated with several of the outstanding manufacturers of paper mill machinery.

In his present position, Mr. Eklund has charge of designing, engineering, supervising, and development work.

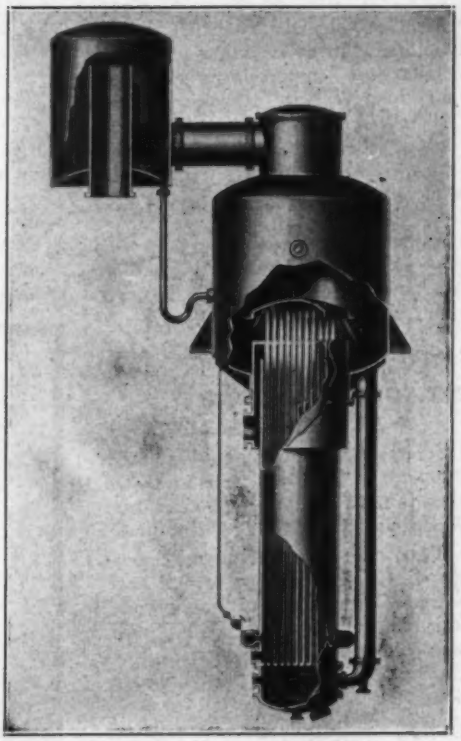
◆

NEW APPOINTMENT AT TIMKEN STEEL & TUBE FOR F. A. SPRANKLE

Metallurgical engineer in The Timken Steel and Tube Division is the new position given A. F. Sprankle, according to recent announcement by The Timken Roller Bearing Company, Canton, Ohio. He was formerly manager of the Alloy Bureau of Carnegie-Illinois Steel Corporation in the Pittsburgh district.

CONKEY EQUIPMENT

will aid Pulp Mills to meet Post-War Conditions



THE CONKEY LONG TUBE FILM TYPE EVAPORATOR

Whether or not a pulp mill operates at a profit under post-war conditions will largely depend upon the installation of equipment which provides dependable and economical performance.

Conkey equipment for pulp mills is designed by engineers who are experienced in the various processes, and is constructed in shops which have for years specialized in the fabrication of materials to best meet the particular problems of such mills.

Conkey Equipment for Pulp Mills includes—

- Long Tube Film Type Evaporators
- Forced Circulation Evaporators
- Waste Sulphite Evaporators
- Electric Caustic Evaporators
- High Concentrators
- Lime Mud Filters
- Causticizing and Lime Mud Recovery Systems
- Digester Circulation Systems

Every Conkey-designed and fabricated unit contains that intangible combination of engineering skill and experience which assures dependable and economical performance.

Conkey Equipment is precision built in the Plate and Welding Division shops at Sharon, Pennsylvania, specialists in plate fabrication for Pulp Mills.

* * * * * * * * *

GENERAL AMERICAN PROCESS EQUIPMENT DIVISION GATX GENERAL AMERICAN

General American Process Equipment is a consolidation of four outstanding process equipment manufacturers, each a well-known specialist in its field, now welded together to serve you with one organization, one responsibility and one high standard of performance.

This Division is also closely associated with the Plate and Welding Division of General American Transportation Corp., at Sharon, Pa.

GENERAL AMERICAN PROCESS EQUIPMENT

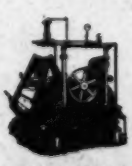
A Division of General American Transportation Corporation

Executive Offices: 437 BAXTER AVENUE, LOUISVILLE 4, KENTUCKY
New York Office: 420 LEXINGTON AVENUE, NEW YORK 17

FRACTIONATING COLUMNS, PRESSURE VESSELS

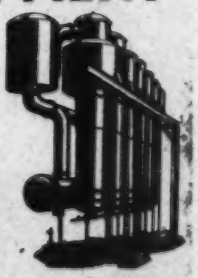
TURBO-MIXERS, AGITATORS, AERATORS

CONKEY VACUUM AND PRESSURE FILTERS



AMERICAN DRUM DRYERS AND FLAKERS

LOUISVILLE DRYERS, COOLERS, KILNS



CONKEY VACUUM EVAPORATORS

Mr. Sprankle is a graduate of the Ohio State University with a degree in metallurgical engineering. He has done three years of laboratory work at Batelle Memorial Institute in Columbus. In 1934 he first joined Timken, specializing in bearing and high temperature steels. While in Pittsburgh, in addition to his regular activities, he gave a series of lectures on alloy steels to postgraduate students at Carnegie Institute of Technology night school.

◆

PERSONNEL CHANGES AT ALLIS-CHALMERS

Several personnel changes have been announced by the Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

Two sales manager appointments are: C. C. Van Zandt, who will have charge of sales of the crushing, cement, and mining section; and H. K. Swan, who is in charge of milling and oil extraction and saw and pulp mill sections. A. J. Schmitz, who has been manager of the company's Seattle office, is now Pacific regional manager. James McClure has been made public relations representative for the Pacific region with headquarters in the company's San Francisco office.

▶▶▶ For the past two years *Roger J. Egan* has acted as eastern representative for the Puget Sound Pulp & Timber Company and the Soundview Pulp Company. Mr. Egan was formerly connected with the Bulkley, Dunton Pulp Company, New York City. It is now announced that he will return to Bulkley, Dunton, with headquarters in the company's New York Office. He joined that company in 1922.

Roger J. Egan

▶▶▶ Two resignations became effective October 1 at the Ohio Boxboard Company, Rittman, Ohio. The position of mill superintendent is being vacated by *Al Manogue*, who left to become general superintendent of the Continental Paper Company, Ridgefield Park, New Jersey. *Ray D. Watkins*, superintendent of the carton division, is establishing himself as an industrial engineering consultant in New York City. As this issue goes to press, no successors have been appointed.

◆

G. G. COBEAN RETURNS FROM LATIN AMERICA

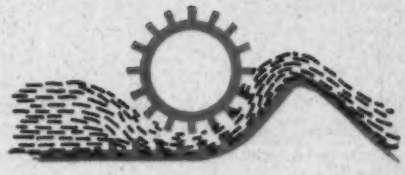
G. G. Cobean, president of Bulkley, Dunton Paper Company, S. A., wrote the following interesting letter to this magazine upon his return from a trip to Latin America:

"Within the past two weeks I have returned from a four months' business trip to Latin America. My itinerary called for stops at every South American country, except Venezuela and Paraguay and, also, included Panama and Cuba. There were 62 separate airplane landings and take-offs and a total of 19,900 miles were covered.

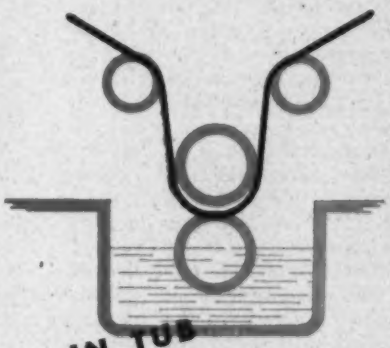
"While in Brazil, where I stayed five weeks, I had the unusual opportunity of studying the possibilities of

PARACOL*

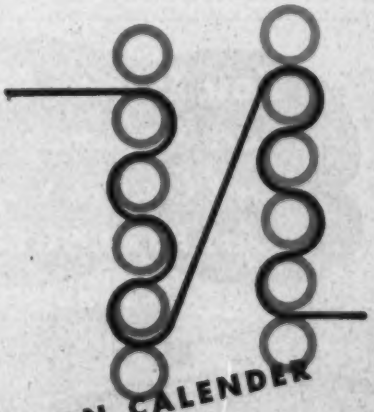
WAX EMULSIONS ...EASY TO USE



...IN BEATER



...IN TUB



...ON CALENDER

...IN COATER

The versatile Paracol* Wax Emulsions mix perfectly with all papermaking materials . . . they may be applied in beater, tub, calender or coater. They deposit the wax where it's needed . . . when it's needed . . . in exactly the right amounts . . . and *uniformly* because the emulsified wax particles are microscopically small.

Your PMC technical representative knows how to help you obtain the best results with Paracol—through our more than 15 years experience in making emulsions and applying them to papermaking problems. For further information on the use of Paracol emulsions in your operations, use the convenient coupon below.

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CHEMICALS FOR INDUSTRY

HERCULES POWDER COMPANY
INCORPORATED

Paper Makers Chemical Department,
961 King Street, Wilmington 99, Delaware

Gentlemen:

My wax problem is.....

Please send me information on.....

Name..... Title.....

Firm.....

Address.....

* Reg. U. S. Pat. Office by Hercules Powder Company

potential paper-pulp production in that country. As a matter of fact, I made a chartered airplane trip, covering 3,000 miles, for that express purpose.

"I was in Buenos Aires during the publication of Secretary of State Hull's note against Argentina and witnessed the exciting street demonstrations which ensued and which were staged by the present Fascist Argentine Government. Having previously lived in that city for many years, I have many friends there, some of whom have had positions of consequence with the present regime.

"Upon leaving Argentina, I continued my trip, visiting all the important markets on the West Coast of South America, in Chile, Bolivia, Peru, Ecuador and Colombia, as well as Panama and Cuba.

"If you feel that my trip may have sufficient reader interest to warrant mention in your publication, I will be very glad to inform you on any particular point which occurs to you.

"Primarily, my trip at this time was for the advancement of our Company's extensive postwar plans in Latin American markets. This involved the renewal of friendly contacts with hundreds of customers with whom I have maintained close business and personal ties since my long residence in South America. I was able to witness at first hand the present economic and political conditions in the different countries visited and, at the same time, to complete arrangements for the extension of our sales organization in those markets in which our Company had not been previously active."

◆

▶▶▶ *Gerald J. Leuck,* formerly with The Miner Laboratories of Chicago, has been appointed director of research of Glyco Products Company, Inc., Brooklyn, New York. In his new position, Dr. Leuck will complete and extend the postwar problems instituted by the company. He will form a new research and development laboratory, staffed by chemists with extended experience in the paper, leather, textile, rubber, paint and plastics industries.

◆

▶▶▶ The new fine paper division of Ecusta Paper Corporation, Pisgah Forest, North Carolina (Cf. P.I. & P.W., Oct., 1944, p. 830), is under the management of *Charles J. Grant.* Prior to joining Ecusta, Mr. Grant was for two years chief of the Fine Paper and Converting Section of the Paper and Paper Products Branch of the Office of Price Administration in Washington.

▶▶▶ The appointment of *Daniel W. Talbott* as general manager is announced by the Cooper Alloy Foundry Company, Hillside, New Jersey. Mr. Talbott formerly was plant superintendent of the Symington Gould Corporation, of Rochester, New York; prior to that he was with the Ohio Steel Foundry Company of Lima, Ohio, in a similar capacity.

◆

▶▶▶ The appointment of *John F. Gilligan* as advertising manager has been announced by Philco Corporation, Philadelphia. Mr. Gilligan joined Philco in 1922 and has served in important positions in the sales, advertising, and order departments. In addition to his other activities he set up and directed the company's statistical and market research section.

◆

▶▶▶ After more than 25 years of service to forest industries as executive head of the National Lumber Manufacturers Association and other national industry associations, *Dr. Wilson Martindale Compton* has announced his early retirement from the management of these activities to accept the presidency of the State College of Washington, at Pullman, Washington.

You Paper Mill Men • take a Tip on Kalamazoo Tile Stock Tanks and Chests • you can't beat them for STRENGTH and DURABILITY •

Kalamazoo Vitrified Glazed Tile is a "Natural" for Paper Mill needs

Smooth, hard, strong, easily cleaned and highly resistant to chemical action, this marvelous vitrified glazed tile type of construction is preferred by scores of leading paper mill executives and engineers. Adaptable for stock tanks and chests of all kinds. Costs no more than concrete tanks that require constant maintenance expense. . . . An exclusive method of glazed tile tank construction developed by Kalamazoo engineers. It provides greater flexibility and lower cost for all paper mill stock handling problems. Immediately available.

● Any Size or Shape Desired—

Wide, narrow—shallow or deep. Round, rectangular or square. Half-round or tapered bottom and corners. Midfeathers and fins where needed to control stock flow. Adaptable to pumps or agitators. Construction individually designed to meet space, tonnage or production requirements.

Ask for engineering data.

Kalamazoo TANK & SILO CO
KALAMAZOO - MICHIGAN

ONLY WORTHINGTON BUILDS 'EM ALL

The Right Pump in the Right Place for Every "Wood Conversion" Process

Here's why you find the right centrifugal pump for your needs when you come to Worthington.

1. Worthington offers the most complete line of sizes and types, which have been designed and adapted through the years to solve those pumping problems which you encounter in your mill.
2. Worthington brings the longest and broadest engineering experience to the solution of difficult or unusual pumping requirements.

Black liquor, for instance, the present and future source of many profitable by-products, defied pump engineers until Worthington developed the only pump that can now handle it with complete success.

If you are now considering *any* pump application, including the handling of corrosive, abrasive, hot, viscous, foamy or solidifying liquids — write us, using coupon below, or telephone the nearest of our 36 district offices.

Worthington Pump and Machinery Corporation, Harrison, N. J.

WORTH BEHIND THE NAME WORTHINGTON

Rotary

Steam

Turbine Well

WORLD'S LARGEST MANUFACTURER OF PUMPS

Power

Centrifugal

CPL-11

WORTHINGTON PUMP AND MACHINERY CORPORATION
Centrifugal Pump Division
Harrison, N. J.

My pumping problem is.....

.....

Name.....

Company.....

Address.....

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NEVILLE NAMES GEIGER DIRECTOR OF RESEARCH

A release from the Neville Company, Pittsburgh, announces the appointment of Lyle M. Geiger to the

L. M. Geiger

position of Director of Research. Mr. Geiger has been associated with Neville for a number of years, during which time he has contributed to the company's work in synthetic resins, solvents and oils used in various grades of rubber and rubber products. In plastics, he broadened the application of the Neville resins and plasticizing oils, and he has done very outstanding work in Neville resins and Nevilloid resin emulsion.

For the past year and a half, Mr. Geiger has served as acting director of research at Neville. The company's experimental pilot plant, which has speeded solution of numerous special chemical problems brought to the company by industrial war producers, continues under his direction.

◆

▸▸▸ The retirement of *William Richter* as general manager of the Fabrics and Finishes Department and the appointment of *J. Warren Kinsman* as his successor have been announced by E. I. du Pont de Nemours & Company, Wilmington, Delaware. These changes were made October 1.

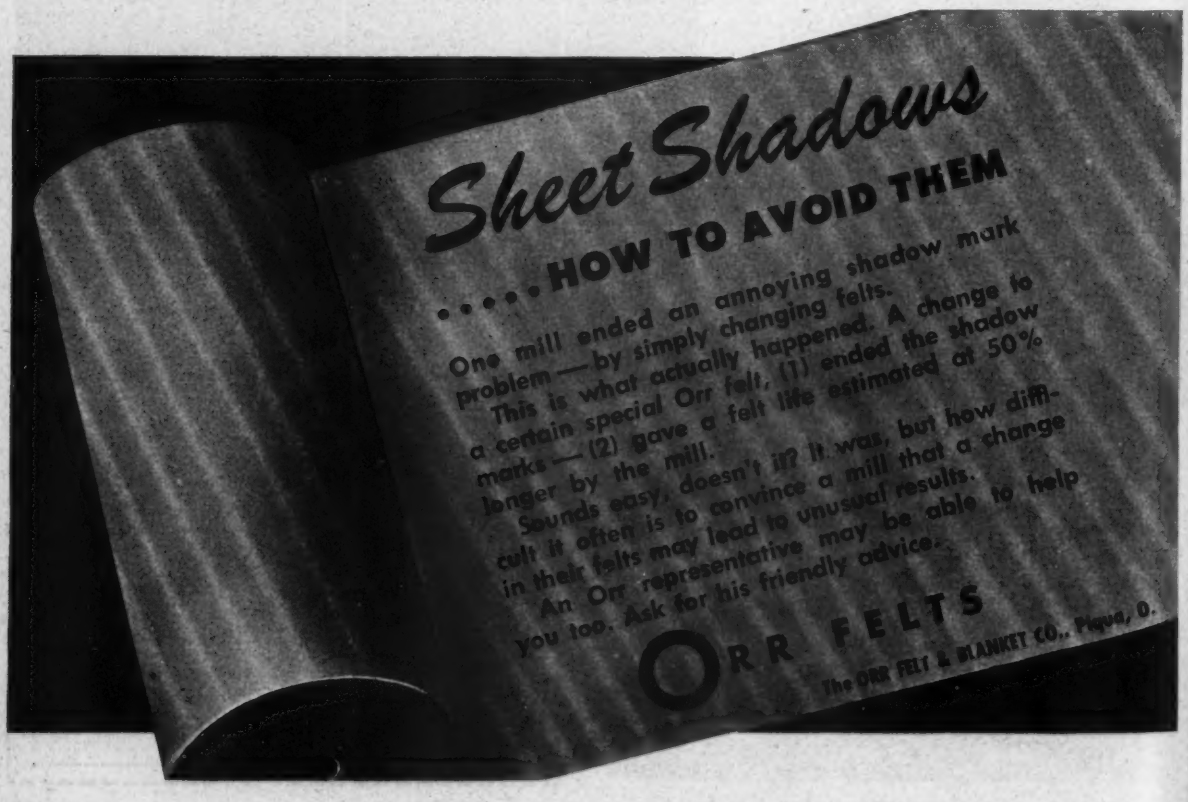
◆

▸▸▸ Effective September 18, *Lucien W. Moore*, previously general purchasing agent of Crane Company, Chicago, was made manager of the valve and fitting sales department, with headquarters at the Crane general offices in Chicago. Mr. Moore is succeeded as purchasing agent by *Thomas J. Hanlon*, who has had wide experience as a buyer in that department.

▸▸▸ Additional sales representation for western Michigan is announced by Reliance Electric & Engineering Company, Cleveland, Ohio. With headquarters in Kalamazoo, Michigan, *M. J. Sandling* will work under the

M. J. Sandling

general direction of J. L. Buell, Jr., who is district manager for Reliance in Detroit. Mr. Sandling was formerly vice president and sales manager of the Howell Electric Motors Company.

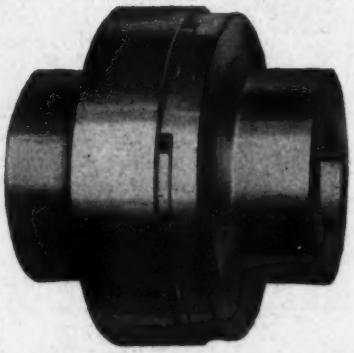

Sheet Shadows
HOW TO AVOID THEM
One mill ended an annoying shadow mark problem — by simply changing felts.
This is what actually happened. A change to a certain special Orr felt, (1) ended the shadow marks — (2) gave a felt life estimated at 50% longer by the mill.
Sounds easy, doesn't it? It was, but how difficult it often is to convince a mill that a change in their felts may lead to unusual results.
An Orr representative may be able to help you too. Ask for his friendly advice.
ORR FELTS
The ORR FELT & BLANKET CO., Piqua, O.

NEW!

L-R SAFEGUARDED COUPLING

PROTECTS MEN AND MACHINERY

L-R Type "C"



The coupling with outside steel collar extension. For duties 2.20 to 170 h.p. at 100 r.p.m. Pat. & Pats. Pend.

Entirely new feature. Additional protection from weather, dirt, moisture. Safeguards clothes and fingers. Boltheads are practically concealed, yet readily accessible. More compact design, with overall smoothness reducing even airflow resistance. Another Lovejoy improvement with most dependable correction for misalignment, and take-up of shock and vibration. Extremely quiet.

L-R FLEXIBLE COUPLINGS

NON-LUBRICATED

NO SHUTDOWNS FOR CHANGING

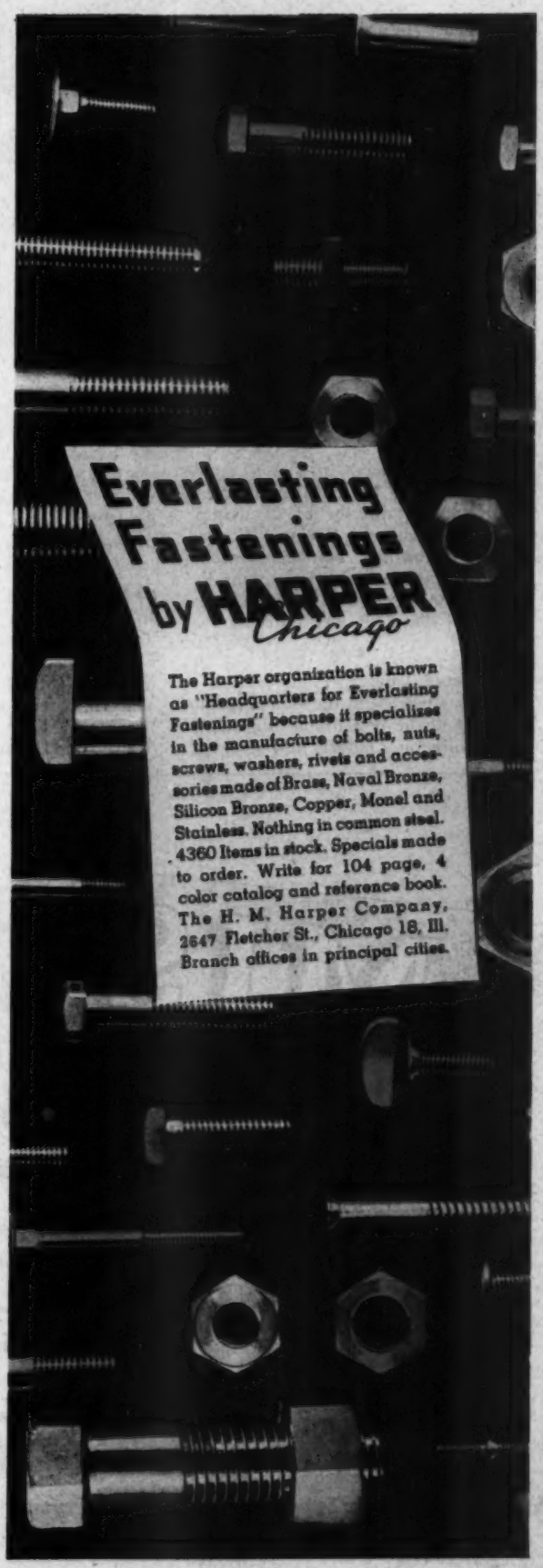
Individual, free-floating load cushions (all materials) hung between rugged jaws always in sight for inspection. No shut-downs for changing. Practically service-free.

CATALOG SHOWS FULL L-R LINE

Couplings for every duty and condition, 1/6 to 2500 h.p. Selector Charts enable you quickly to pick couplings for your exact needs. Wire or write

LOVEJOY FLEXIBLE COUPLING CO.

5060 West Lake St. Chicago 44, Ill.


Everlasting Fastenings by HARPER Chicago
The Harper organization is known as "Headquarters for Everlasting Fastenings" because it specializes in the manufacture of bolts, nuts, screws, washers, rivets and accessories made of Brass, Naval Bronze, Silicon Bronze, Copper, Monel and Stainless. Nothing in common steel. 4360 Items in stock. Specials made to order. Write for 104 page, 4 color catalog and reference book. The H. M. Harper Company, 2647 Fletcher St., Chicago 18, Ill. Branch offices in principal cities.

▶▶▶ The election of *Allison L. Bayles* as vice president has been announced by the American Engineering Company, Philadelphia. Mr. Bayles was formerly director of research and development with the Rogers Diesel and Aircraft Corporation.

◆

▶▶▶ For many years manager of the Los Angeles branch of International Printing Ink Corporation of California, *C. R. Whistler* has relinquished his branch administrative duties in order to concentrate on important contacts and postwar plans. He remains vice president of the company. *Joseph D. Richardson* will succeed Mr. Whistler as Los Angeles branch manager.

◆

▶▶▶ The promotion of *Dr. Richard M. Hitchens* to the position of associate research director of Monsanto Chemical Company's Organic Chemicals Division has been announced. Dr. Hitchens was formerly assistant director; the research director of the division is Dr. L. P. Kyrides.

◆

▶▶▶ Since January, 1942, *John W. Sands* has been with the Conservation Division of the War Production Board at Washington. He has now resumed his duties with the Development and Research Division of The International Nickel Compay, Inc., at New York.

◆

▶▶▶ General manager of Monsanto Chemical Company's Plastics Division at Springfield, Massachusetts, *Felix N. Williams* has been elected a vice president of the company. Mr. Williams started with the Swann Chemical Company, Anniston, Alabama, which was later acquired by Monsanto.

◆

▶▶▶ *Willis F. Avery,* who has been with The B. F. Goodrich Company since 1924, and assistant secretary since 1936, was elected secretary of the company at the September meeting of the board of directors. He succeeds the late Shelby M. Jett, secretary since 1927. The company's patent and legal departments will be under his direction.

◆

▶▶▶ On November 1 *William R. Willets* returned to his duties in the Titanium Division of the National Lead Company, New York City. Mr. Willets served as consultant on pulp and paper, and printing and publishing in the Conservation Division of WPB since January, 1942.

▶▶▶ The appointment of *George Green* to the position of vice president in charge of sales is announced by the Mt. Vernon Car Manufacturing Company, Mt. Vernon, Illinois. This company is a division of H. K. Porter Company, Inc., Pittsburgh. Mr. Green has served as railway sales manager of Elastic Stop Nut Company for the past year; previous to that time he was for ten years with Union Asbestos & Rubber Company, Chicago.

◆

▶▶▶ For the past several years *Svarre Hazelquist* has been chief chemist in the Weyerhaeuser Timber Company's Pulp Division, Longview, Washington. He has now been named technical director to succeed *Edward P. Wood,* who will be assistant manager of the Hollingsworth and Whitney Company's plant at Mobile, Alabama. *A. E. Erickson* has been advanced to chief chemist to succeed Mr. Hazelquist.

◆

▶▶▶ On November 15, *W. K. Kidder* terminated his connection with the Office of Price Administration of the Chicago Metropolitan Office. Mr. Kidder has been connected with the Chicago office of OPA since 1942. He first served as Regional Paper Specialist in the Price Division.

MISCO 'C'

The Corrosion Resistant Alloy

CAST • ROLLED • FABRICATED

is best for

Digester Neck Rings • Blow-off Valves
Acid Valves • Digester Bottom Sleeves
Digester Heads • Bottom Crosses
Strainers • Fittings • Acid Pumps • Piping
and all other
equipment exposed to corrosion by sulphite acids

MICHIGAN STEEL CASTING COMPANY *1999 Guoin Street* **DETROIT 7, MICHIGAN**

MISCO Heat and Corrosion Resistant Alloys

One of the World's Pioneer Producers of Chromium-Nickel Alloy Castings

*Trade-mark of the American Cyanamid & Chemical Corporation applied to its synthetic resins for use by the paper industry.

On Both WET and DRY ISSUES!

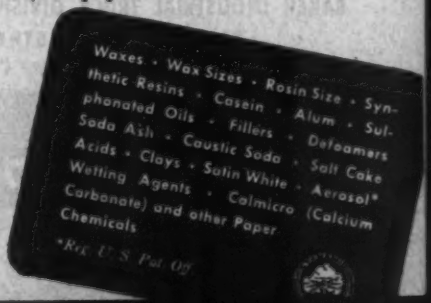
...Cyanamid Wet-Strength Resin Also Adds to Paper's Dry-Strength Qualities!...

PAREZ, American Cyanamid's new melamine paper resin, provides manufacturers with a simple method of increasing both wet and dry strength of paper. No special paper machine equipment is needed—just add PAREZ directly to the fibers, prior to the formation of the web.

When PAREZ is added to the fibers, greater wet strength of paper ensues because the fibers bond together and become resistant to separation when exposed to moisture or liquids. As the paper comes off the machine, tests reveal important improvements in dry strength also—higher burst and tensile strength, along with a pronounced increase in folding endurance.

Translating this great improvement in paper's wet and dry strength into practical, daily advantages, the paper industry notes shortened beating time, leaving fibers longer without sacrificing strength. Improved dimensional stability under varying humidities, results in an important aid to good register in multicolor printing. Lowered basis weights are possible without sacrificing needed tensile and folding strengths. And improved rosin sizing of lightweight papers is apparent, especially when exposed to severe wet conditions.

All these aids to better and stronger paper manufacture make PAREZ a wartime favorite with the armed forces for military applications such as maps, lens polishing, machinery cleaning, blueprint and photographic papers, tags, charts and bags. Write for details or talk with your Cyanamid representative to learn how PAREZ can fit into your peacetime marketing plans and open new and larger uses for your papers.


Waxes • Wax Sizes • Rosin Size • Synthetic Resins • Casein • Alum • Sulphonated Oils • Fillers • Defoamers
Soda Ash • Caustic Soda • Salt Cake
Acids • Clays • Satin White • Aerosol*
Wetting Agents • Calmicro (Calcium Carbonate) and other Paper Chemicals
*Reg. U.S. Pat. Off.

American Cyanamid & Chemical Corporation

(A Unit of American Cyanamid Company)

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Mass.; Philadelphia, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Chicago, Ill.; Kalamazoo, Mich.; Detroit, Mich.; St. Louis, Missouri; Azusa, Calif.; Seattle, Wash.

In Canada: Dillons Chemical Company, Ltd., Montreal and Toronto

IS YOUR PROBLEM ONE OF MAINTAINING PRODUCTION WITH LESS *Manpower?*

Proper use of mechanized material handling equipment can help offset manpower losses. Most plants find that a Baker Truck—with a single operator, will release a number of men for other duties. Faster handling of materials speeds production in other ways, too. If you have a manpower problem, the actual case histories below may offer a solution. Many more are reported in the New Baker Catalog.

★ ★ ★ ★ ★

One company writes "With our Baker Truck we increased storage area by stacking, releasing valuable space for production . . . We were able to save the labor of six men and speed movement from receiving platform to storage—saving elevator tie-up . . . we removed the ever-present danger of strains and hernias." (See illustration at left.)

Records show that one of the first ram trucks, introduced by Baker in 1922, realized savings of 35 man hours per carloading for a steel mill. Today ram trucks are standard equipment for handling coiled materials. Illustration at right shows one of a fleet of Baker Trucks in the world's largest, most modern stainless mill.

"Womanpower" has replaced lost manpower and helped maintain production in thousands of plants. Because of their extreme ease of handling, Baker Trucks are ideal for women operators. Illustration at left shows a truck in service at a plant of the world's largest aluminum producer.

A fleet of eight Baker Trucks keeps the plant of a large domestic range manufacturer—now engaged in turning out war goods—at top production. Trucks service machines with materials to keep them running without interruption. Faster movement of parts and products in plant, warehouse and on loading platforms has cut handling costs 75%. (See illustration at right.)

An important factor in maintaining production in a large aircraft plant is the minimizing of "down-time" of large presses. The Baker Die Handling Hy-Lift Truck makes quick work of removing or placing dies in position—and simplifies their storage. (See illustration at left.) This plant also uses Baker Crane Trucks for speeding operations on the assembly line.

The problem of handling efficiently the wide variety of materials at a large chemical manufacturing plant is solved by a fleet of Baker Fork Trucks. (See illustration at right.) In carloading operations alone, on a conservative estimate, one Baker Truck replaces seven men with hand trucks.

WRITE FOR YOUR COPY

Plant and production managers, traffic managers, superintendents, purchasing agents and any others concerned with material handling will find the new Baker Catalog No. 52 a valuable reference.

BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Company*

2169 WEST 25th STREET • CLEVELAND, OHIO

In Canada: Railway and Power Engineering Corporation, Ltd.

Baker INDUSTRIAL TRUCKS

Necrology

C. K. WILLIAMS

C. K. Williams, chairman of the board and treasurer of C. K. Williams & Company, Easton, Pennsylvania, passed away at his home in Easton on October 12. He was 82 years of age.

In 1880, Mr. Williams went to Easton and joined his father who operated a mill for the production of talc. This was the start of the company which now has mills in New York, Pennsylvania, Georgia, Ohio, Illinois, and California. Mr. Williams was an organizer and treasurer of the Paper Makers Chemical Company, which was sold in 1931 to the Hercules Powder Company. At the time of his death he was treasurer also of the Easton Explosive Company; the National Milling and Chemical Company, and the Paper Makers Importing Company.

◆

WILLIAM BAUSCH

Chairman of the board of Bausch & Lomb Optical Company, Rochester, New York, and last surviving son of John Jacob Bausch, founder of the firm, William Bausch passed away October 19 at the age of 83. His passing followed closely that in July of his brother the late Dr. Edward Bausch, formerly chairman of the board of the company.

Mr. Bausch had been with the company for over 69 years and was widely known for his developments of optical glass which grew out of experiments he began in 1903. He was responsible for the founding of the optical glass making plant, the first of its kind in America.

◆

AUSKER E. HUGHES

Supervisor in the research department of Wyandotte Chemicals Corporation, Wyandotte, Michigan, Ausker E. Hughes passed away on October 23.

Dr. Hughes was born in North Carolina in 1905. He received his doctorate in physical chemistry from the University of North Carolina. He was a member of TAPPI and the American Chemical Society, and had formerly been associated with the Champion Coated Paper Company, Hamilton, Ohio, and the U. S. Department of Agriculture at Orlando, Florida.

X 4 V 3 1 8

How a mosquito almost wrecked "the Big Ditch"

That gigantic engineering feat, the Panama Canal, would have been a hopeless task had it not been for the pioneering efforts of two army surgeons—Walter Reed and William Crawford Gorgas. It was Reed who in Cuba after the Spanish-American War proved that yellow fever is spread by a certain species of mosquito; and Gorgas who practically eliminated the dangerous insect by sanitary controls, ridding Havana of the yellow death. Later Gorgas went to the Panama Canal Zone where, after an heroic struggle, he finally freed that vital strip of land from the ravages of the *Aedes aegypti* and made possible completion of the canal. Yankee ingenuity and teamwork overcame obstacles that stopped the famous French engineers who built the Suez Canal. Little did Gorgas and Reed dream that their incomparable teamwork would help open up a quick route between two oceans and protect their country in global wars of the future . . . .

Teaming Up for Better Paper

No business can be any stronger or more successful than the other industries that serve it. This is especially true of the paper industry with its specialized machinery problems.

Perhaps you have worked with us and know firsthand the value we attach to teamwork—of how we study your individualized requirements and focus all our engineering skill and experience on finding the most profitable answer for you.

When we stop producing for Uncle Sam we expect to have a lot of practical ideas and information that will be useful to the machinery side of your business. Then as before the war our prime objective will be to help you produce more paper of better quality at lower cost. This is the kind of cooperation you will want on the profit side of the ledger.

THE BEVIS MACHINE COMPANY, MIDDLETOWN, OHIO

RICHLAND
TRIPLEX
ALL COTTON
ASSOCIATED WITH UNIFORM QUALITY FOR OVER HALF A CENTURY
Efficiency + Economy = RICHLAND TRIPLEX in Dryer Felts

Minimum shrinkage and stretch, and a high degree of porosity that spells lower steam consumption are among the salient features that have given RICHLAND TRIPLEX All Cotton Dryer felts pre-eminent recognition in the paper field. Add to these the highly uniform long-wearing contact surfaces of RICHLAND TRIPLEX and you'll realize why these heavy duty dryer felts have been for years the choice of paper men who want economical production costs with maximum dryer felt efficiency. The next time you need a superior felt . . . specify RICHLAND TRIPLEX All Cotton.

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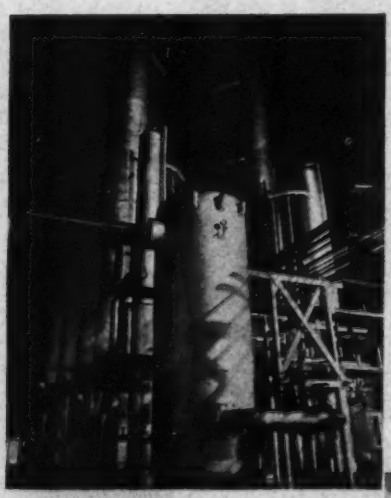
have established *a Notable Service Record*



Penicillin

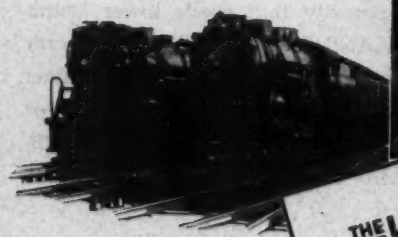
In tanks and jeeps, bombers and pursuit planes, "ducks" and landing craft, submarines and Liberty cargo Ships . . . in the busy industries which turn out America's vast armaments . . . in giant refineries, synthetic rubber units, chemical and power plants . . . on every front LUNKENHEIMER VALVES are performing a *vital indispensable service.*

Highest grade materials, simplicity of design, rugged durability, super-accurate machining of every part—these are qualities which have made LUNKENHEIMER VALVES a leading choice of American industry for more than three quarters of a century.

In addition to the superior workmanship which comes of long-accumulated experience, rigid tests at every step in the manufacturing process assure dependable performance and low-cost maintenance in these *Longer-Life Valves.*

Your LUNKENHEIMER Distributor is always ready to help you with problems of maintenance, repair, and operation. His complete facilities are at your service.

Ducks, Trucks, L.S.T. Craft
(Photo U.S. Signal Corps)



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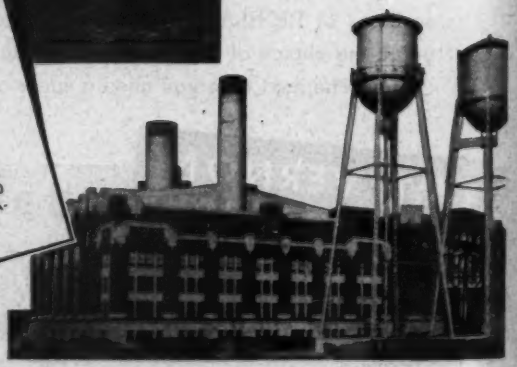
BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S. P., BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS.



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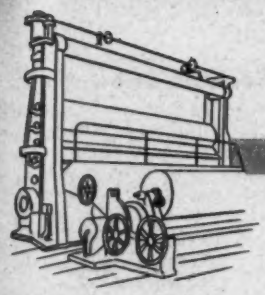
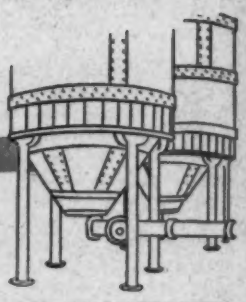


Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

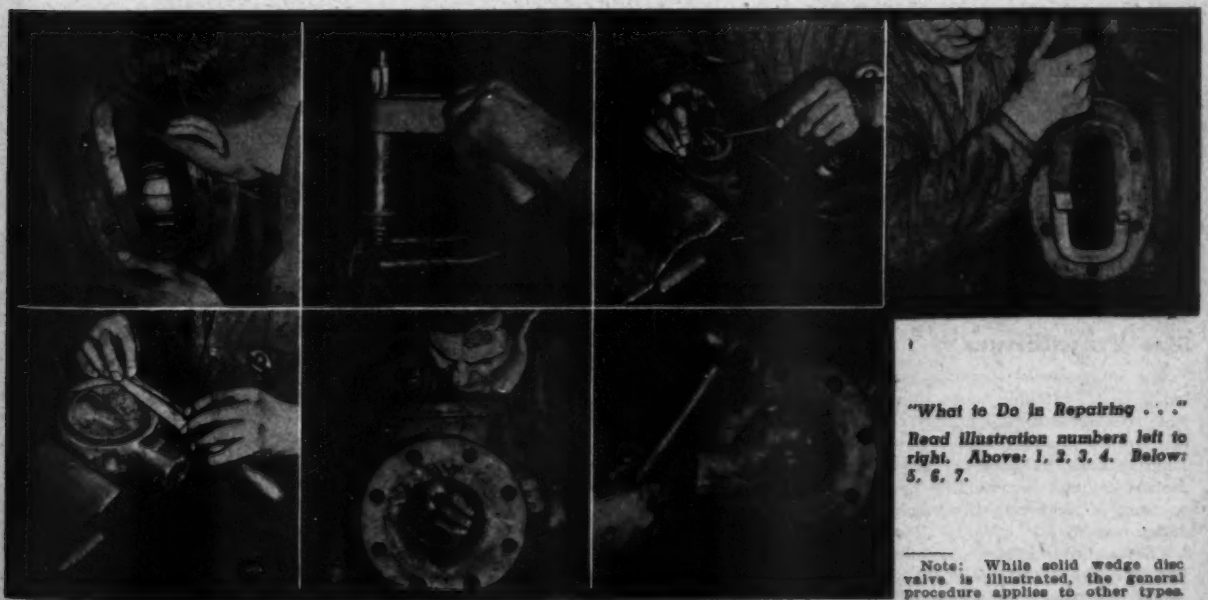
What to Do in Repairing Leaky Gate Valves

When you definitely know that a valve leaks at the seats, don't delay in examining it to find out why. Neglected leaks will damage seating surfaces beyond repair. In new installations, leakage may be due to dirt or pipe scale. Immediate inspection and cleaning may prevent serious damage. While a gate valve can often be repaired in the line, working on it at a bench is much more convenient. After removing the bonnet, clean and examine the disc and body thoroughly. (Illus. 1) Carefully determine the extent of damage to body rings and disc. If corrosion has caused excessive pitting or eating away of metal as in the case of guide ribs in the body, it may be impractical to attempt repairs. A complete checkup and servicing of all parts of the valve is recommended. Remove the stem from bonnet and examine it for scoring and pitting where the packing bears. As a rule, light polishing with fine emery cloth is all that's needed to put the stem in good condition. (Illus. 2) Use "soft" jaws if you put stem in vise. Next, remove all the old packing and clean out the stuffing box. (Illus. 3) At the same time, clean inside of valve bonnet and other parts of dirt, scale, corrosion, etc., to keep them from getting into valve seats. It doesn't pay to salvage an old gasket. Remove it completely and replace with one of proper quality and size. (Illus. 4) If after cleaning and examining all parts, it develops that repair can be accomplished by removal of cuts from disc and body seat faces or by replacement of body seats, proceed as follows: (Frequently the disc can be saved even though cut deeply, as replacement body seat rings for some valves are furnished with slightly heavier shoulder thickness to compensate for excessive wear on disc.) Set the disc in a vise with the face leveled. (Illus. 5) Wrap a piece of fine emery cloth around a flat tool and rub or "lap" the entire bearing surface (both sides of disc) to a smooth, even finish. Remove as little metal as possible. The usual cuts and scratches found on body rings can also be repaired by "lapping." Use an emery block small enough to permit convenient rubbing of the rings all around. (Illus. 6) Work carefully and watch closely; avoid removal of too much metal to prevent disc seating too low. When seating surfaces (disc and body rings) are properly "lapped-in" coat faces of disc with Prussian blue and drop it in the body to check the "bearing." When a good continuous contact is obtained, the valve will be tight—and is ready for reassembly. When assembling, first insert stem in bonnet, install new packing, assemble other parts, attach disc to stem and place assembly in body. Raise the disc to prevent contact with the seats and so that the bonnet can be properly seated on the body before tightening the joint. When seat rings in gate valves must be replaced, they can be removed and replaced best with a power lathe. Chuck up body with rings vertical to the arbor and use a strong steel bar across the ring lugs to unscrew them. Removal by hand can be done with a diamond point chisel (Illus. 7), being careful not to hurt the threads. The new rings must be "socked home" tight. A big wrench on a steel bar across the lugs will help, when rings must be put in by hand. Always be sure to coat the threads with a good lubricant before putting them in. Lap-in the rings (Illus. 6) for a perfect fit to disc.—CRANE COMPANY.

◆

Metal Cutting with Power Saw Blades

Selection of the correct blade for the job is vitally important in power saw operation. Blade length is easily determined by size of the machine and size of work being cut, but number of teeth per inch is dependent upon the nature of the stock. A few general rules in proper selection of blade follow: (1) The thinner the stock (this applies to wall thickness in the case of tubing), the finer the teeth. Observe the "three-tooth rule," i.e. no fewer than three consecutive teeth should always be in contact with the stock. (2) The harder the stock, the



"What to Do in Repairing . . ."

Read illustration numbers left to right. Above: 1, 2, 3, 4. Below: 5, 6, 7.

Note: While solid wedge disc valve is illustrated, the general procedure applies to other types.

finer the teeth. (3) In general, use as coarse a tooth as possible, except as limited by the two rules above.

Check the machine to determine whether it is a draw cut or push cut machine; be sure to place the blade in the saw with teeth pointing in the direction of cut. Strain the blade tightly in the saw and after the first few strokes, tighten it again, for it will have stretched slightly. Set up the work so that blade will not be started at too great an angle to the surface of the piece.

Most modern machines allow a wide range of speeds, and it is just as important to run sawing machines at proper speeds for each individual job as it is to run a lathe or any other machine tool at proper speed for any particular job. Running the blade too fast overheats the teeth, dulling them quickly. In general, the harder the stock, the slower the speed must be. Use of a cutting lubricant allows a considerable increase in speed and helps flush out the chips. Whenever possible, this should be used when cutting any metals except cast iron, copper and brass. Do not use too much cutting lubricant; a blade cuts faster "warm" than "cold." When the lubricant steams slightly, the temperature is not necessarily too high. Tungsten alloy blades should not be run over 60 strokes per minute when cutting dry, seldom over 100 strokes per minute when a cutting lubricant is used. "Moly" and High Speed Steel Blades may be run more rapidly.

When the machine does not govern feed automatically, use in general a moderately heavy feed and increase this pressure as the blade dulls to insure that the teeth will cut rather than slip. On soft stocks, too great a pressure will jam the teeth and break them. In general, use the heaviest feed that will not break the teeth. When in doubt, use slower speed, heavier feed.

Watch closely for signs of dulling teeth. It is false economy to run a dull blade in a machine. A new blade costs less than the additional time you would spend and the additional power the machine would consume in waiting for a dull blade to do the job. Avoid whenever possible replacement of blades in the middle of a cut. When this must be done, turn over the work and start a new cut from the opposite side of the piece, for a new blade will invariably jam in an old cut. —Clemson Bros., Inc.

◆

Calculator Selects Proper Size Transformer

War plants have caused a mushroom-like growth of trailer camps and barrack-type housing projects. In many instances they are in locations remote from utility company lines. As a result, many an industrial engineer has had the problem of operating a residential distribution system dumped in his lap.

The calculator quickly tells the proper size transformer to install for a given number of range and lighting customers. Likewise, it tells when a transformer should be replaced due to overload. Three loading scales (100 per cent, 125 per cent and 150 per cent) are shown on the periphery. Thus, if desired, transformers can be replaced when they reach 100 per cent of nameplate rating or 125 per cent or 150 per cent. Since peak loads are rarely maintained for more than an hour or two, most engineers use the 150 per cent scale.

Suppose there are 13 range and 120 lighting customers—set the dial accordingly. Now note that the arrow calls for a 37½ kv.-a. transformer on the 150 per cent scale. Lighting demands are assumed to be 300 watts per customer. Range demands vary according to a hyperbolic curve—3.6 kw. for one range, decreasing to approximately 1.1 kw. per range for 21 or more units.

Certain transformer sizes which are no longer manufactured (20, 30, and 40 kv.-a.) are included on the calculator for the convenience of those companies still having them in use.

To Assemble the Calculator

Cut along the inner and outer circles to make a ring and a disc. Mount these pieces on separate pieces of cardboard using rubber cement. Punch the center hole carefully. Insert a brass bolt (with washers) to hold the parts together. Add a nut to the bolt and tighten—the discs should turn easily yet hold their setting. A drop of solder on the nut makes the assembly permanent.—V. W. Palen (*formerly with Westinghouse Electric and Manufacturing Company*).

Paper Machine Showers

Showers on a paper machine—for fourdrinier wires, felts, dandy rolls and cylinder molds—serve two primary purposes: (1) To remove stock from wires and felts, (2) To remove filler, dirt, scale and pitch.

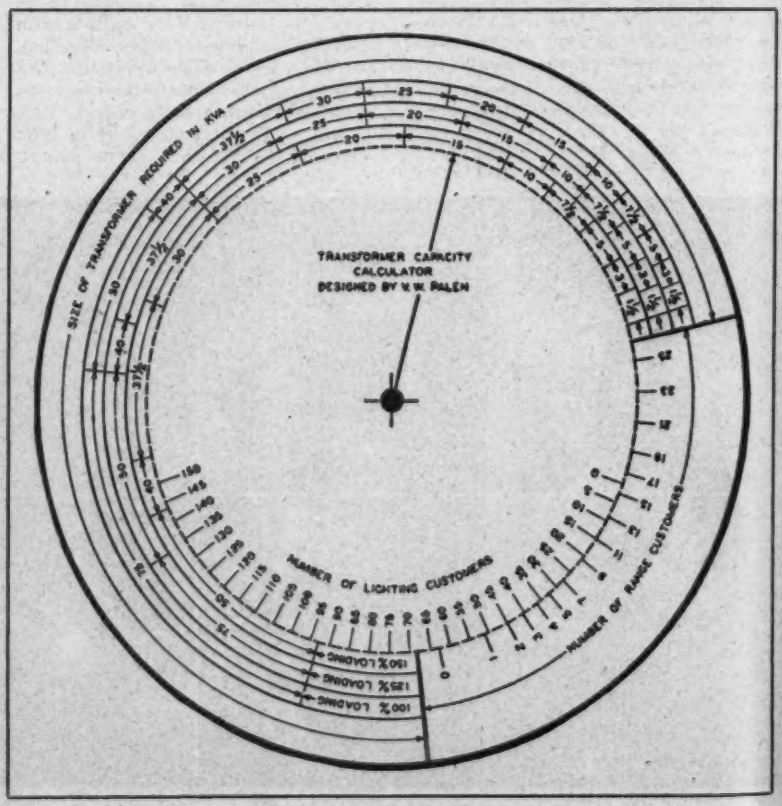
When a wire is to be washed clear of paper stock, it may be either the whole sheet that has to be removed when a break occurs, or fibers in the wire. The fibers may adhere freely to the wire; or they may become stapled in the mesh between the warp and shute wires.

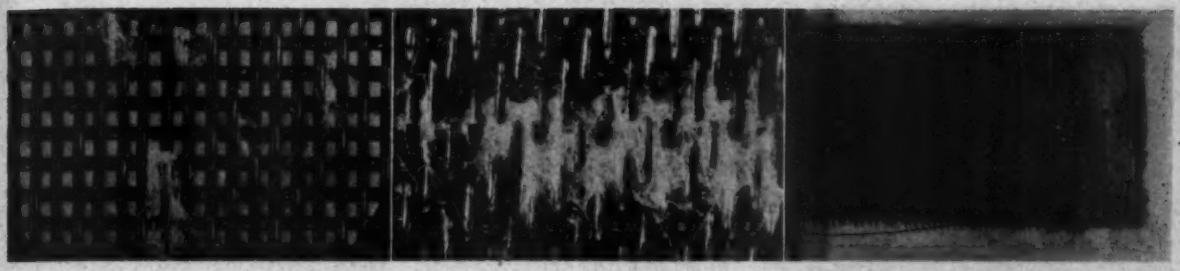
Pin holes and seam marks in the sheet are frequently caused by stapled fibers. As the stock is carried along by the wire, fibers adhere to the fibers already in the wire and thus are pulled out of the sheet—resulting in pin holes or seam marking, or both.

Short fibers apparently adhere freely to a wire and usually can be washed completely clear with a shower. The longer stapled fibers may require removal mechanically by means of a wire brush or a doctor in some form.

Showers utilizing white water, high in long fiber content, are not very effective in keeping wires clean. Under a condition of this kind, fibers are put back into a wire. When a white water shower does not clean a wire thoroughly, a fresh water, high-pressure (60 to 80 lb.) needle shower should be tried. If it does not clean the wire completely, it should be supplemented with a wire brush or doctor.

It is also very important to keep the edges of wires clean and free of stock and fillers. The loading of edges will cause a wire to become stiff and, because of the





Left—Fibers stapled into wire mesh. Center—Fibers stapled into wire seam. Right—Edge of wire loaded.

lack of pliability, it will have a tendency to crack. Fillers and scale formation from hard water are particularly troublesome. When deckle straps are used, loaded edges cause added abrasive action on the wire. When stock accumulates on stationary parts of the machine near a wire edge, or when it builds up on the rolls at this point, the wire edge will be stretched and weakened. Clean edges will reduce to a minimum the loss of production resulting from a machine shutdown to trim or sew edges when cracks appear.

The position of edge showers, and the volume and pressure of the water, to properly remove trim and keep edges clean are important factors on the wet-end. The volume of water required for edge showers is not very great. For this reason, many mills prefer to use fresh water in a needle shower at high pressure. Scale or pitch is difficult to remove with a shower alone. Removal is accomplished by dissolving them with the proper chemical solutions.—EASTWOOD-NEALLEY CORP.

◆

Blowing

Blowing can be defined as the inclusion of air between the felt and the sheet of paper, or between the respective plies of the sheet of paper itself. Inability of this air to get away produces a blister in the sheet, which is extremely undesirable. Blowing can occur at the cylinders or at the baby presses.

The various causes for blowing at the cylinders are as follows:

1. Excessive hydration of stock
   a) Over-beating or over-Jordaning
   b) Stock standing in chests too long
2. Running liner on bottom felt with stock relatively slow, as compared to the filler
3. Excessive suction on bottom liner cylinder
4. Uneven couch rolls (mostly old felt couches)
5. Insufficient forward off-set of couch rolls
6. Uneven cylinder surface
7. Too heavy pressure on couch, or too heavy couch, causes blowing at succeeding cylinders or baby press section
8. Too much kerosene in the vat (used to prevent foaming) getting into the felt and interfering with case of wetting
9. Greasy felts
10. Close felts
11. Thick felts

The possible causes for blowing at the baby presses are as follows:

1. Incorrect off-sets (top roll too far forward)
2. Excess couching may pass the effects through into the baby presses
3. Close felts and dirty felts

The remedies for various conditions of blowing may be listed as follows:

1. Increased freeness of stock
2. Decreased consistency in the vats and increased suction at the cylinders
3. Decreased suction on the cylinder on the bottom liner, permitting the first liner to be poorly formed (will weaken the test)
4. Eliminate one Jordan on the liner stock. Stock should be somewhat coarser on liner cylinder and not as fine as the filler. Use less liner beaters or use two Jordans on the filler and one on the liner. (Note—These various questions in regard to filler and liner are not as likely to arise when the liner is put on at the last cylinder.)
5. Raise the couch on the preceding cylinder. Sheet and felt will run into the following cylinder in wetter condition, thus excluding air
6. Shut off whipper and showers and increase the vacuum in the box following the whipper. (Causes felt to pack down, but it will also dirty up more quickly.)
7. Shut off vacuum in the box following the whipper and thus cause the felt to enter the cylinder wetter, also excluding air
8. A mild bath of soda ash also tends to pack the felt down and harden it
9. Slightly reduced nap on sheet side of felt
10. Open up the felt
11. A starting treatment using a surface tension reducing agent for thorough and rapid wetting.—*Kenwood Bulletins*, F. C HUYCK & SONS.

◆

Chemistry of Acetylene

Acetylene is produced by merely bringing calcium carbide into contact with water in an approved generator. The gray, stone-like carbide is manufactured from coke and lime in an electric furnace. Chemically, it is a compound of calcium and carbon, while water, as generally known, is a compound of hydrogen and oxygen. When these two compounds are brought together, a reaction takes place and new and different compounds are formed. The calcium in the carbide unites with the oxygene in the water to form calcium oxide, which in turn immediately reacts with more water to form calcium hydroxide, which is the chemical name for ordinary slaked lime. Carbon from the carbide and hydrogen from the water combine to form acetylene, which has the chemical formula C_2H_2. This is just the chemist's way of saying that its molecule is composed of two atoms of carbon and two atoms of hydrogen. He would state the whole reaction thus:

$CaC_2 + 2H_2O = C_2H_2 + Ca(OH)_2$
(Calcium Carbide) (Water) (Acetylene) (Slaked Lime)—*Oxy-Acetylene Tips*. (January, 1943).

◆

Location of Fire Extinguishers

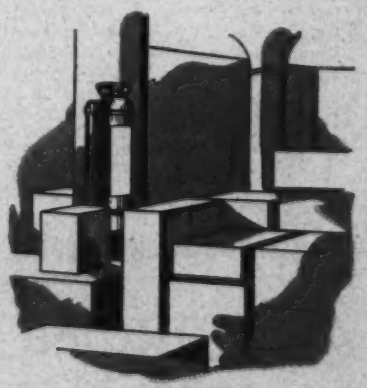
The position of your extinguishers, in relation to the hazard, is important. The following rules should be followed in placing the equipment:

Locate the equipment close to the likely hazard—but not *too* close. For instance, if an extinguisher is provided to guard against a possible spill fire, put it a little away from the point where the spill is likely to occur and out of the direction of the flow.

Make sure the extinguisher will be accessible *when fire breaks out*. An extinguisher placed at the back of a small storeroom, where fire would block access to it, would be useless in fighting that fire. It should be hung outside the storeroom door.

Locate the extinguishers in a conspicuous place, so that everyone can see them clearly in an emergency.

Avoid locations where materials might sometimes be piled around the extinguisher, blocking access or hiding it from view.



Don't place equipment so that it juts out into a busy aisle, where trucks, dollies, etc., might knock down or damage it.

Where a wheeled extinguisher is stationed, be sure the aisles leading from it are wide enough to accommodate the equipment.—WALTER KIDDE & CO., INC.

SPECIAL TRAPS
speed air removal on paper dryer rolls

● Developed specially by Armstrong for paper dryer roll service, these traps have extra air elimination capacity in addition to their regular function of removing condensate without steam loss. Results are higher production and lower costs, through faster heating, better quality paper and fuel savings. Users say there is nothing like this trap for dryer roll service.

Other production aids for paper industries: Armstrong compound traps for digesters; evaporators, etc. . . . forged steel traps for high pressure power plant service . . . and regular traps for heaters, cooking tanks, space heating coils, unit heaters and other equipment.

INVALUABLE FOR YOUR FILES—write for copy of Armstrong Trap Book, illustrating construction, operation and application details.

ARMSTRONG MACHINE WORKS
816 Hoffman St., Three Rivers, Mich.

ARMSTRONG STEAM TRAPS

The Economics of the Kraft Paper Industry*

MARTIN WILLIAMS, University of Alabama

▶▶▶ IN RECENT YEARS, the kraft, or sulphate, process has become the most important pulp producing method. About 45% of all wood pulp made in the United States is now produced by the kraft process. The United States Tariff Commission divides the United States into four pulp and paper producing regions: the Northeastern, Lake and Central, Southern, and Pacific Coast regions. The kraft branch of American papermaking is essentially a Southern industry, as about 83% of all kraft production is in the South (*62*), and over 90% of the South's pulp production is kraft pulp.

RAW MATERIALS

In any manufacturing process, there are three fundamental factors of production: raw materials, labor, and capital. In the paper industry there is a further division of raw materials into pulpwood and chemicals.

Pulpwood

In the preparation of pulp, the woods most commonly used are coniferous, although deciduous woods are also suitable. The most often used woods are spruce, hemlock, fir, jack pine, the southern pines (long-leaf pine, short-leaf pine, slash pine, and loblolly pine), tamarack, and white pine, of which the southern pines are the most important (*33*).

Prior to 1938 about 7,000,000 cords of wood were used annually in the United States for pulp production. Of the total pulpwood consumption in the United States, from 10% to 15% is normally imported from Canada (*59*), however, this figure does not indicate the great dependence of the United States in normal times on foreign pulpwood. Our annual paper consumption before the War was about 11,000,000 tons, which required over 12,000,000 cords of wood. Normally, we import about 2,000,000 tons of paper in the form of newsprint, and about 2,000,000 tons of pulp, of which about 30% is kraft pulp (*10*). In 1941, we had a record consumption of 17,304,000 tons of paper, for which 16,259,000 cords of wood were required. Estimates of consumption in 1943 show figures of 16,700,000 tons of paper, and 15,000,000 cords of wood (*29*).

In 1938, 2,452,076 tons of kraft pulp was produced from 4,025,540 cords of wood at the rate of 1.63 cords per ton. Of this, 3,261,404 cords was southern pine. About half the pulp is used in making paper and the rest is used in making container and other boards (*18*).

Most domestic pulpwood is cut on lands less than 100 miles from the mill where it is used. Even so, transportation is an important item in the cost of pulpwood, ranging from 10% to 30% of the delivered cost. Only about 10% of all the wood used for making kraft pulp is from lands owned or controlled by the companies producing the pulp.

Year-end mill inventories of pulpwood represent huge stocks of raw material and a large capital investment. The average pulpwood inventory of all kraft pulp mills in the United States represents 20% to 25% of their annual pulpwood purchases.

In 1934, the average delivered cost of pulpwood in the South was $4.85 per cord, and on the Pacific Coast, the second most important kraft pulp producing region, it was $6.10 (*60*). The current ceiling price for pulpwood in the Southeast is $6.80 per cord for pine, and $10.50 per cord for peeled hardwoods (*25*).

The paper industry in the South began at a time when lumber production was at its peak, and millions of acres of cut-over land and less desirable tracts of timber were available for pulpwood. Although lumbering operations have been somewhat reduced, they have continued to be of dominant importance, so practically the same situation prevails today (*53*).

Chemicals

Salt Cake: Salt cake, or sodium sulphate, is the most important chemical raw material used in the kraft process. Salt cake consumption in the United States increased from 195,000 tons in 1925 to 503,000 tons in 1937. This was due largely to the growth of the kraft industry, which accounted for 48% of the total salt cake consumption in 1925, and 75% in 1937. During this same period, our domestic production of salt cake increased only from 220,000 tons to 297,000 tons. About 75% to 80% of this was produced as a chemical by-product, largely from hydrochloric acid production.

This great increase of consumption over production resulted in an increase of salt cake imports from 2,000 tons in 1925 to 220,000 tons in 1937. In that year, more than 83% of our salt cake imports were from Germany. While the average value of domestic salt cake at the producing plants fell from $16.08 per ton in 1925 to $9.81 in 1937, the delivered price of imported salt cake to southern mills during this entire period was consistently below that of domestic salt cake, being $0.59 per ton less in 1937.

In January, 1944, the price of domestic salt cake was $15.00 per ton. In 1927, an average of 352 lb. of salt cake was required for each ton of kraft pulp produced, while in 1934, the average salt cake requirement was 364 lb. per ton of pulp. Assuming an average requirement of 360 lb. of salt cake per ton of pulp, the present consumption of salt cake by the kraft industry would be about 800,000 tons per year (*1, 21, 30*).

Recent developments of interest are the use of gypsum as a partial substitute for

(*)Reprinted from a paper read before the April, 1944, meeting of the American Chemical Society in Cleveland, Ohio, and published in *Chemical and Engineering News* (Sept. 10, 1944).

X-Men

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salt cake, and the production of so-called "synthetic salt cake."

The major reason why the kraft process has been economical is that it is possible to recover a large part of the chemicals for reuse in a continuous cycle.

Sulphate cooking liquors contain two active ingredients: sodium hydroxide and sodium sulphide. Although salt cake is not an ideal source of these two materials, it has been the cheapest source.

Salt cake is relatively hard to reduce to sodium sulphide, requiring a high temperature at which sodium sulphide is partially volatile, which results in high stack losses.

In the recovery process the loss of sulphur is always much greater than the loss of alkali. Regardless of the condition of the returned black liquor, it is not possible to recover a smelt from it alone, which will maintain the sulphidity of the original cooking liquor, as the sulphur content of the black liquor is largely in the form of complex organic compounds.

It is believed that many of the defects of ordinary salt cake may be overcome by the use of synthetic salt cake. The synthetic cake is now manufactured by sintering together soda ash and sulphur, in proportions to make the chemical equivalent of salt cake in sodium oxide and sulphur content. Its composition and method of production make it an especially reactive material, readily reduced to sodium sulphide.

When this material is heated in a limited amount of air, reaction occurs, and sodium sulphide and various sulphates are formed. As this reaction is exothermic, the total heat required to form sodium sulphide is much less than with sodium sulphate. Synthetic salt cake is now produced commercially and is available to kraft pulp manufacturers (*32*).

Lime—Another important chemical raw material in the kraft industry is quicklime. It is used for recausticizing the green liquor produced from the black ash formed in the smelting furnaces. The amount required per ton of pulp varies from 150 to 500 pounds. In 1938, the total consumption of lime in the United States was 3,300,000 tons, with 402,000 tons of 12% used by chemical pulp mills. Probably between 200,000 and 250,000 tons of this was used in the production of kraft pulp. Prices for lime have remained quite constant, being $6.29 per ton in 1936, $6.46 in 1937, $6.10 in 1938, and $7.00 in 1944 (*2, 21, 23*).

Chlorine — Chlorine, which is usually produced by the electrolysis of a saturated salt solution, is the most important agent used in the bleaching of chemical pulp. Production of chlorine in the United States increased from 200,000 tons in 1929 to 440,000 tons in 1938, and in the pulp industry, the annual consumption of chlorine increased from 96,000 to 150,000 tons. These figures do not include the chlorine made and consumed by the pulp mills (*3, 24*).

The amount of chlorine used in bleaching kraft pulp is usually about 8% to 12% of the total weight of the pulp. In 1943, 746,281 short tons of bleached and semi-bleached sulphate pulp were produced, while 3,502,269 short tons of unbleached sulphate pulp were produced (*4, 30*). Assuming that each ton of bleached kraft pulp required 10% chlorine, the chlorine used by the kraft industry in 1943 would be 75,000 tons. Largely because of increased volume and technical improvements, f.o.b. prices of chlorine dropped from $49.08 per ton in 1929 to $36.43 per ton in 1937, and have remained fairly stable since then (*24*). In January, 1944, the price was $35 per ton (*30*).

Alum—Alum or aluminum sulphate is an important material in sizing kraft paper. The paper industry uses more alum than does any other industry, accounting for 37% of the alum produced in the United States in 1937 (*4*). One mill reports the use of 25 lb. of alum per ton of paper produced (*20*). Prices of alum have been quite steady, being $23.01 per ton in 1929, $21.58 in 1931, $22.27 in 1937, and $23 to $25 in 1944 (*4, 30*).

Rosin—Pine rosin is also quite extensively used in sizing paper. The pulp and paper industry is the largest consumer of rosin, using about 30% of the total domestic consumption (*4*). Figures for one mill show that it uses about 18 lb. of rosin for each ton of paper produced (*20*). Prices of gum rosin declined from $5.73 per barrel of 280 lb. gross weight in 1929, to

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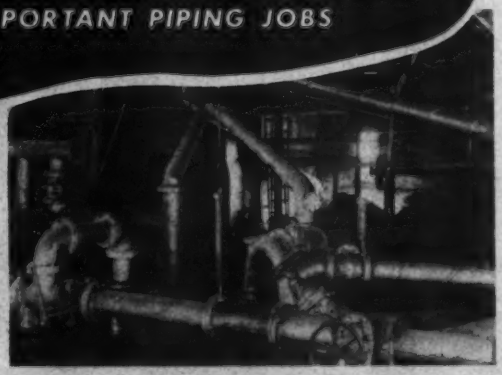

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$2.90 in 1933, and then rose to $6.56 in 1937 (*5*). The price of rosin has practically doubled since then, being $11.56 in January, 1944 (*30*).

POWER, FUEL, AND WATER

The items of power, fuel, and water are important in the kraft industry. In 1934, the power cost for producing unbleached slush kraft pulp in the South was $2.37 of a total of $23.64 per ton of pulp, or 10% (*58*). For one particular kraft mill, 1000 kilowatt hours of electrical energy are used per ton of paper produced (*63*). In 1929 the sources of power for all United State pulp and paper mills was: steam 43%, waterwheels 29%, electric motors driven by purchased electrical energy 27%, and internal combustion engines about 1%. The present day trend is toward the use of steam and purchased electrical energy (*34*).

Coal is the most commonly used fuel. In the mill previously mentioned 1.35 tons of coal are used in the production of each ton of paper (*64*). Other fuels used are fuel oil and natural gas (*63*).

A great deal of water is used in the production of pulp and paper. It is essential that the water be clean and pure. Thus ti may be necessary to filter and treat the water chemically before using it. The mill mentioned above uses 125,000 gallons of water per ton of paper produced (*20*).

LABOR

Labor may be defined as any human effort, physical or mental, used in production. For accounting purposes, labor expense is usually divided into three parts: (1) salaries, (2) direct labor, and (3) indirect labor (*35*). A United States Tariff Commission Survey of the kraft pulp industry in 1934 showed that 74% to 80% of the total labor force represented direct labor (*54*).

In 1934, operating labor represented 12% of the total cost of producing unbleached slush kraft pulp in the South, and administrative expenses were 3.9 (*58*). A more recent estimate places labor's total share in value of production of paper for the entire United States pulp and paper industry at between 25% and 30% (*37*).

In the paper industry, as in other mass-production industries, the productivity of labor increases with increase in plant capacity. The following table gives the increase in production per worker with increase in plant capacity (*36*).

Capacity Tons per Day	*Tons per Productive Worker per Day*
0-10	1.18
11-25	2.13
26-50	3.87
51-100	5.92
101-200	6.82
201 and over	8.30

CAPITAL

The third factor of production is capital. From an economic standpoint, capital goods are classified as fixed capital, which is not consumed when used one time, and working capital, which is consumed with one use.

In 1933, the American Paper and Pulp Association estimated that the total capital investment of the United States pulp and paper industry was $1,500,000,000, while the value of paper produced that year was $559,700,000, giving a capital turnover ratio of 2.68. For the American pulp and paper industry as a whole, the capital turnover is about 1.5 years in good times, and about 2.6 years during depressions. In 1939, the pulp and paper industry ranked seventh among all American industries in terms of invested capital. Total assets in 1939 were nearly $2,500,000, of which about $500,000,000 was represented by other investments (*31*). For southern kraft paper the capital turnover ratio in 1933 was 2.04, and for boards, in the production of which a large amount of kraft pulp is used, the ratio was 1.27. The capital turnover ratio in the kraft industry varies between 1 and 2, with an average of about 1.5 (*15*). The capital investment per employee for the entire United States pulp and paper industry in 1933 was estimated to be about $14,000, and the capital invested per ton of production was estimated to be about $163 (*38*). Both of these figures would probably be much lower now, because of the great increase in production.

PRODUCTION

Production of kraft pulp has greatly increased in the past 25 years. In 1919, 3.4% of all pulp made in the United States was kraft; in 1929, 19%; 1935, 30%; and in 1943, 45%. Most of this increase has occurred since 1935, when kraft production was 1,500,000 tons, compared with 4,394,338 tons for 1941 (*46, 47, 48, 50*). Practically all this expansion has been in the South, where the total capital invested in the industry more than doubled between 1935 and 1940. Consumption of kraft pulp continued to increase faster than production, however, and until 1939, a large part of all kraft pulp used in the United States was imported, chiefly from the Scandinavian countries. In 1926, about 33% of all kraft pulp consumed in the United States was imported; in 1929, 33%; 1936, 29%; and in 1943, 3½% (*20, 48, 50, 55*). Exports of kraft pulp have always been negligible, reaching a high of 3% in 1940 (*31*).

An increasing percentage of all kraft pulp consumed in the United States in recent years has been bleached. In 1928, 4½% of the kraft pulp used was bleached; in 1930, 6½%; in 1936, 10% and in 1943, 18% (*50, 56*). The total consumption of bleached kraft in the United States rose from 100,000 tons in 1933, to 844,179 tons, in 1943. The production of bleached kraft increased from 62,000 tons, or 4% of the total production in 1933, to 320,000 tons, 13% in 1938 and 746,261 tons, or 18% in 1943 (*43, 44, 45, 50*).

The kraft industry has undergone a tremendous expansion since 1935. Practically all of this has been in the South. The South, as generally spoken of, contains the following thirteen states: Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Ken-

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tucky, Louisiana, Arkansas, Texas, and Oklahoma. Pulp and paper mills are found in all of these states except Kentucky and Oklahoma. On January 1, 1940, there were 47 pulp and paper mills operating or under construction in the South. These mills represent an investment of $200,000,000. Over $100,000,000 of this investment has been added since 1935 (*51*). These mills use over 4,000,000 cords of wood annually, and provide employment for 40,000 men. This is about twice the number of employees in the pulp and paper industry in the South in 1935.

Although there is a fairly wide distribution of pulp and paper mills throughout the South, there has been a marked tendency in recent years, for pulp and paper mills to secure tidewater locations. Thus we find most of the mills on the Atlantic and Gulf coasts.

About 90% of all pulp made in the South is produced by the kraft process (*25, 63*). Of the 47 pulp and paper mills in the South in 1940, 28 used the kraft process. These 28 mills had a capacity of 2,664,000 tons annually. This was 80% of the capacity of all kraft mills in the United States. One company, the Southern Kraft Division of International Paper and Power Company, had a capacity of about 960,000 tons annually in 1940, about 36% of the South's total kraft capacity (*26*).

With kraft mills in the South running at capacity, the value of the finished products made each year will exceed $180,000,000 (*22*).

The cost of producing kraft pulp is much less in the South than in any other section of the country. In 1934, the total average cost of producing unbleached slush kraft pulp in the Lake and Central region was $37.80 per ton; in the South, $23.64 per ton; and on the Pacific Coast, $27.66 per ton. In the Lake and Central region, we find the following break-down of production cost; wood, $14.65; conversion costs, including labor, chemicals, and power, $18.41; administrative expenses, $1.67; and interest of investment, $3.12, with a credit for sale of by-products of .06. In the South, the cost of wood was $6.80; conversion cost, $14.39; administrative expense, .93; and interest, $1.59, with a credit for by-products of .07. On the Pacific Coast, the cost of wood was $8.66; conversion cost, $15.31; administrative expense, $1.01; and interest $2.76, with a credit for by-products of .08. The cost exclusive of interest of bleaching kraft pulp in 1934 was found to be from $8.78 to $12.91 per ton of pulp (*58*). Although the actual production costs have greatly changed since 1934, it is the opinion of the United States Tariff Commission that the same percentage break-down of costs would prevail in the South now as in 1934, although probably not in the other two regions (*61*).

While the lower prices for wood and the lower wage rates in the South are largely responsible for the lower production costs in the South, it is also likely that another reason for the difference in costs is the difference in type of kraft pulp produced. Most of the kraft pulp produced in the South is used for producing wrapping and bag papers and board, while a large part of the pulp produced in the other regions, as well as the imported pulp formerly used, is used for lighter paper and specialties (*58*). However, the lower production costs in the South may also be due to the fact that the pulp mills in the South are generally larger than those in the other sections. Thus, the lower costs in the South may be merely a necessary result of a large scale production in that section.

MARKETING

There are four major channels for the distribution of paper in the United States: from the mill to the paper merchant; from the mill to the side-line merchant, who handles paper only in connection with the wholesale distribution of other commodities, such as groceries or drugs; from the mill direct to the publisher or manufacturer of paper products, in which the sales may be made through the mill's own sales organization, or the paper merchant; and from the mill direct to chain stores, mail-order houses, or buying syndicates.

Direct purchases from the mill are usually made only by customers who buy in large quantities. Shipments are generally made in carload or larger lots, and frequently consist of but a single item.

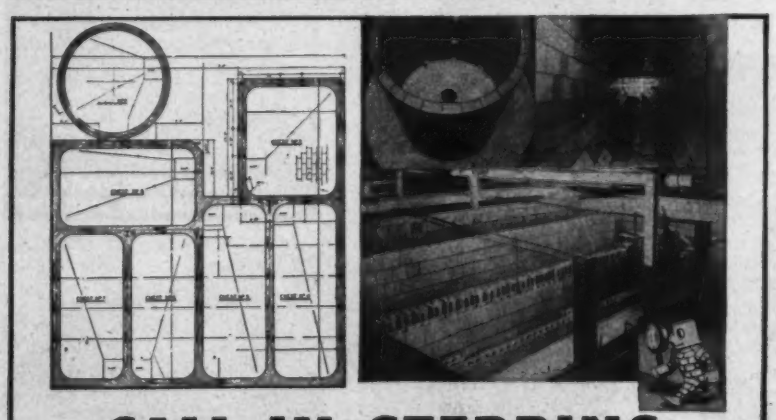
The two most important classes of items made from kraft pulp are wrapping papers and boards. Wrapping papers are usually sold through paper merchants, although substantial amounts of wrapping papers are sold through side-line merchants, and a few direct sales are made to chain stores, buying syndicates, and large converters.

Probably over one-half of the sales of boards are made direct to large converters, such as manufacturers of shipping containers and boxes. About one-fourth of the board sales are made through the paper merchants, and are made to bookbinders, printers, and others engaged in similar trade (*42*).

THE FUTURE OF THE KRAFT PAPER INDUSTRY

Perhaps a few guesses about future developments in the kraft industry will not be amiss in closing. These developments will fall into two main classes: technical and technological changes, those which have their birth in test tubes and beakers, in research laboratories and experiment stations; and economic and political changes, those which come from government bureaus and conferences of manufacturers.

In the realm of technical changes, perhaps the most logical thing to consider first is the development of new sources of raw materials and better utilization of our present sources. The industry is quite largely dependent on southern pines for its wood supply. Forests in the South, where the kraft industry in strongest, contain about 500,000,000 cords of pine, and an equal amount of hardwoods. In recent



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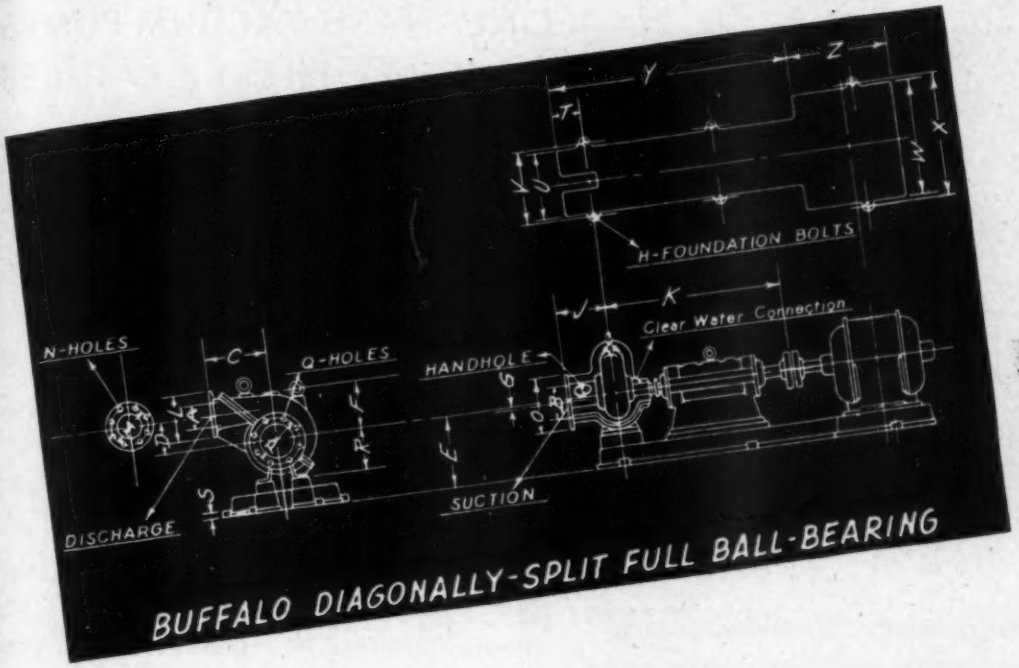
years the annual consumption of pines has exceeded the annual growth, while the reverse is true of hardwoods. About half of the total volume of hardwoods is made up of the so-called "pulping hardwoods," gums, cottonwood, poplar, bay, and maple. Tests at the Herty Foundation Laboratory in Savannah, Georgia, have shown that gums pulp readily by the kraft process, giving higher yields than pines, with less consumption of steam and chemicals. In bleaching, only about one-half as much chlorine is needed for pulps made from gums as for those made from pine. This pulp produces paper with physical characteristics comparable to those of paper made from pulp produced from pine. Gums are now actually used with pines for pulp production (*25*). The other "pulping hardwoods" as well as the denser woods (oak and hickory) are reduced by the kraft process. These pulps resemble the usual soda pulps, and would probably be most useful as fillers with the longfibred pine pulps (*7, 8*).

Another development is the increasing exploitation of by-products. At least four plants in the South use kraft mill wastes in producing industrial soaps and oils, from which are made such products as asphalt emulsifiers, inks, paints, varnishes, core oils, cutting oils, plasticizers, resins, flotation agents, and rust-proofing compounds. The basic material for the manufacture of the soaps and oils in tallol, the most important waste material in the kraft process. About 50 pounds of tallol, worth about $36 to $42 per ton, can be obtained per ton of pulp produced (*10*). While the manufacture of useful materials from kraft wastes is still in its infancy, utilization of waste materials from the sulphite pulping process has been going on for several years. An outstanding example of this is the manufacture from the wastes of one sulphite pulp mill in Wisconsin of over half of all the vanillin used in the United States (*9, 27, 28*).

Other developments should include a greater diversification in the types of paper produced from kraft pulp, and an increasing use of kraft pulp in the production of newsprint, which generally contains 80% groundwood pulp and 20% chemical pulp (*54*).

One of the major objections to the kraft process is the obnoxious odor emitted by kraft mills. It is believed that this is quite largely due to the escape of large amounts of chemical smoke from the recovery furnaces in a pulp mill. About 75% of the material in the smoke is salt cake, and it has been estimated that under normal conditions, about one-sixth of the total salt cake used, may be lost in this way. In addition to the salt cake, there is present in this smoke sodium sulphide, traces of hydrogen sulphide, and large quantities of carbon and volatile organic compounds. The odor is due largely to organic compounds present, which adhere to the colloidal particles of salt cake. Many of these compounds, such as the mercaptans, produce a noticeable odor, when their concentration in air is only about one part per million. This chemical smoke is at a low temperature, and after being released from the stacks of the pulp mill, soon reaches the ground, and is spread over an area of several square miles. It has been found that the use of electrical precipitators greatly reduces the amount of smoke released, and therefore practically eliminated the customary kraft mill odors (*14*). This practice should show a widespread increase, not so much from aesthetic reasons, but because of the saving to the mill in salt cake consumption, through reduction in loss of salt cake from the recovery furnaces.

In 1936, the annual drain of saw timber in the United States was about 1.2 times the annual growth (*49*). Although wood pulp production accounts for only about 4% of this annual drain (*16*), we can see that with the expected increase in paper consumption in the United States, adequate future supplies of pulpwood will require that the pulpwood production problem not be considered independent, but as a part of a national program of forestry, in which pulpwood production would be integrated with the growing of timber for lumber production. With such integration, lumber production could be restricted to the larger-sized material most suitable for this purpose, while the smaller materials, tops of saw trees, and sawmill waste could be used economically by the pulp mills. Such a program to be successful, would require a much more intensive and extensive for-



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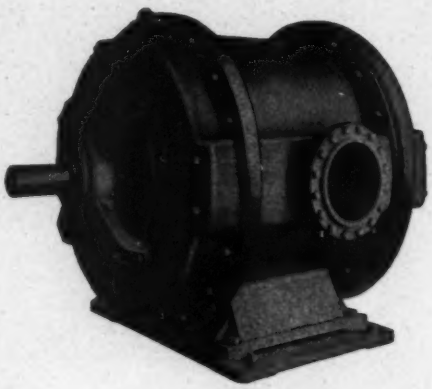

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estry program on the part of the pulp and paper companies, lumber companies, and the Federal Government. The bulk of this increased production of saw timber and pulpwood will have to come from the Southern and Pacific Coast regions, where the heaviest stands of timber are found, and where exist the best prospects of a greatly increased production (*12, 25*). A start toward putting America's forests on a sustained yield basis was made by the Civilian Conservation Corps (*39*), and it is hoped that this effort will be renewed after the war.

From its very beginning, the American pulp and paper industry has been regarded as an industry "vested with the public interest" (*40*). Although the kraft branch of the industry has been a profitable one, such has not been true of the industry as a whole, which has often undergone unprofitable overexpansion. During the days of the National Recovery Administration, practices were allowed such as limitation of production and stabilization of prices, which had been previously prosecuted under the Sherman Anti-Trust Act (*41*). It would be to the advantage of the paper industry as a whole, and to the kraft industry, after its period of rapid expansion, interrupted by the war, slackens off, for the government to allow producers more co-operative action toward stabilizing prices and productive capacity. It appears that the cartel system of Europe, which has long been illegal in the United States, offers the pulp and paper industry its best means of economic health (*17*).

It has been said that, "Paper is the primary modern necessity. There is no saturation point in sight" (*19*). The per capita consumption of paper in the United States is greater than that of any other commodity, with the exceptions of water and milk. The per capita consumption in the United States is even more than twice that of meat. In 1941, when the per capita consumption of paper was 300 pounds, the consumption by classes was as follows: paperboard, 123 pounds; newsprint, 59 pounds; wrapping paper, 40 pounds; book paper, 30 pounds; fine paper, 11 pounds; tissue paper, 14 pounds; and all other kinds, 22 pounds (*6*). This annual consumption is expected to increase for several years, with the largest expected increase in boards, wrapping and bag papers, for which a large part of the present kraft production is now used. The use of kraft pulp in the manufacture of all other types of paper is also expected to increase and it is believed quite possible that the total annual kraft pulp capacity in the United States will reach 7,000,000 tons by 1950, a 33% increase over that of 1943 (*13, 16, 50*). Thus, the economic aspects of the kraft paper industry should occupy an increasingly important part in our total national economic scene. This should be especially true in the South, which for too long has had an economy based almost entirely on cotton, lumber, and tobacco, and where the great expansion of the kraft industry has been regarded as the most outstanding economic development of the recent business depression (*22*).

ACKNOWLEDGMENTS

The author wishes to express his gratitude to Dr. S. J. Lloyd, dean, School of Chemistry, University of Alabama, for suggesting and guiding this study; to Mr. H. F. Cotter, assistant professor of pulp and paper chemistry, University of Alabama, for advice and assistance in obtaining much of the material used, to James E. Reynolds, student, in the School of Chemistry, for the preparation of graphic material; and to H. H. Yoder, vice president, Gulf States Paper Corporation, for checking the data and helpful criticism of the manuscript.

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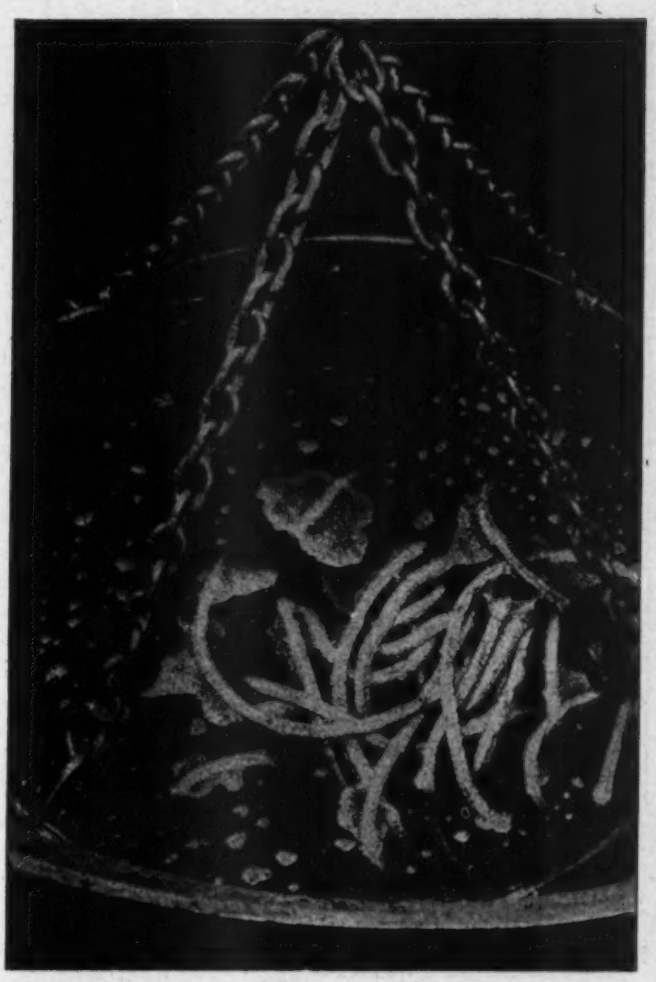

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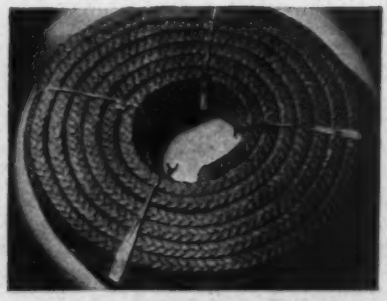

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Postwar Employment Suggestions for Employers in the Paper and Pulp Industry*

I. LABOR NEEDS IN POSTWAR PERIOD

To attempt to estimate the labor needs of the paper industry in the postwar period is to attempt to estimate the labor needs of all industry since paper manufacture, sales and use are dependent on the situation, economically, throughout the country.

However, enough facts are known that enable one to hazard at least a guess. The paper industry's employ during war time did not expand; in fact, most mills are making more paper with less manpower now than they did before the war. The paper industry will not be faced with a conversion problem but will continue to make paper. In most cases pulpwood stockpiles are low; in fact, inventories are generally low and will need replenishing all along the line.

It is our considered opinion that the immediate postwar period is bright for the paper industry and employment will not fall below prewar levels—in fact, it should increase—and this, of course, means an increase over present levels.

However much the above will maintain from an overall industry standpoint, each mill will necessarily have to study its individual prospects to determine its probable needs and then study each department with at least the following factors in mind:

a. Present employees
b. Jobs belonging to members of the armed services
c. Number who will leave the department—such as women, handicapped workers, older men and minors
d. Number of new people needed
e. Possible sources

It is advisable for each mill to analyze its position in connection with each employee and if this is done, management will have a clear picture of its needs and be prepared for most situations that may arise. (A suggested form is shown on page 1054 for making such an inventory.)

II. RETURNING VETERANS

For the purpose of the following recommendations, we will assume that each mill, through its personnel department, has kept in touch with its former employees and will know how many plan to return, how many do not, and how many cannot even though they might wish to do so.

Veterans, through the Selective Service Law (Section 8) and through the so-called G. I. Bill, have certain rights and privileges.

Veterans, according to law, are entitled to their old job with no loss in seniority when they return, providing they are physically fit and apply for a job within forty days after their discharge. When two or more veterans return who had the same job and both claim the job, the Veterans' Bureau rules that the job belongs to the permanent employee who left it first.

While most employers will endeavor to place each returning veteran who worked for him before entering service, considerable finesse will be required in some instances to satisfy the veteran, the union and also the present incumbents.

(*) Prepared by Industrial Relations Committee of the American Paper and Pulp Association, New York, N. Y.

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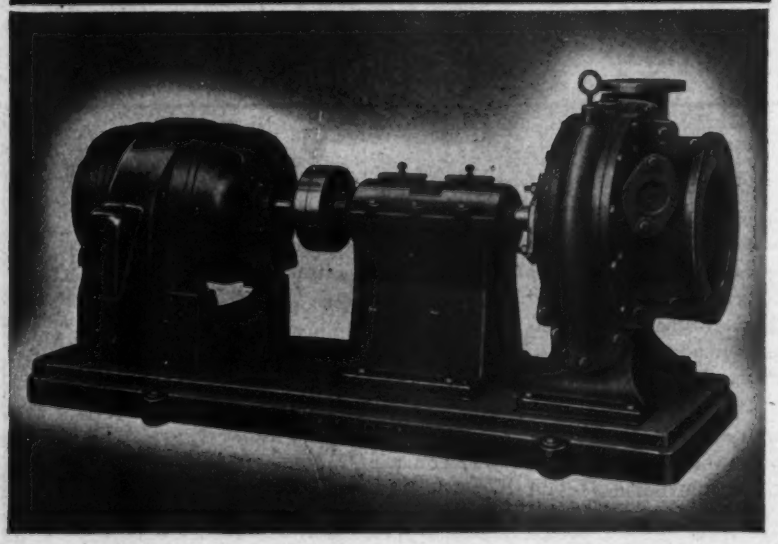

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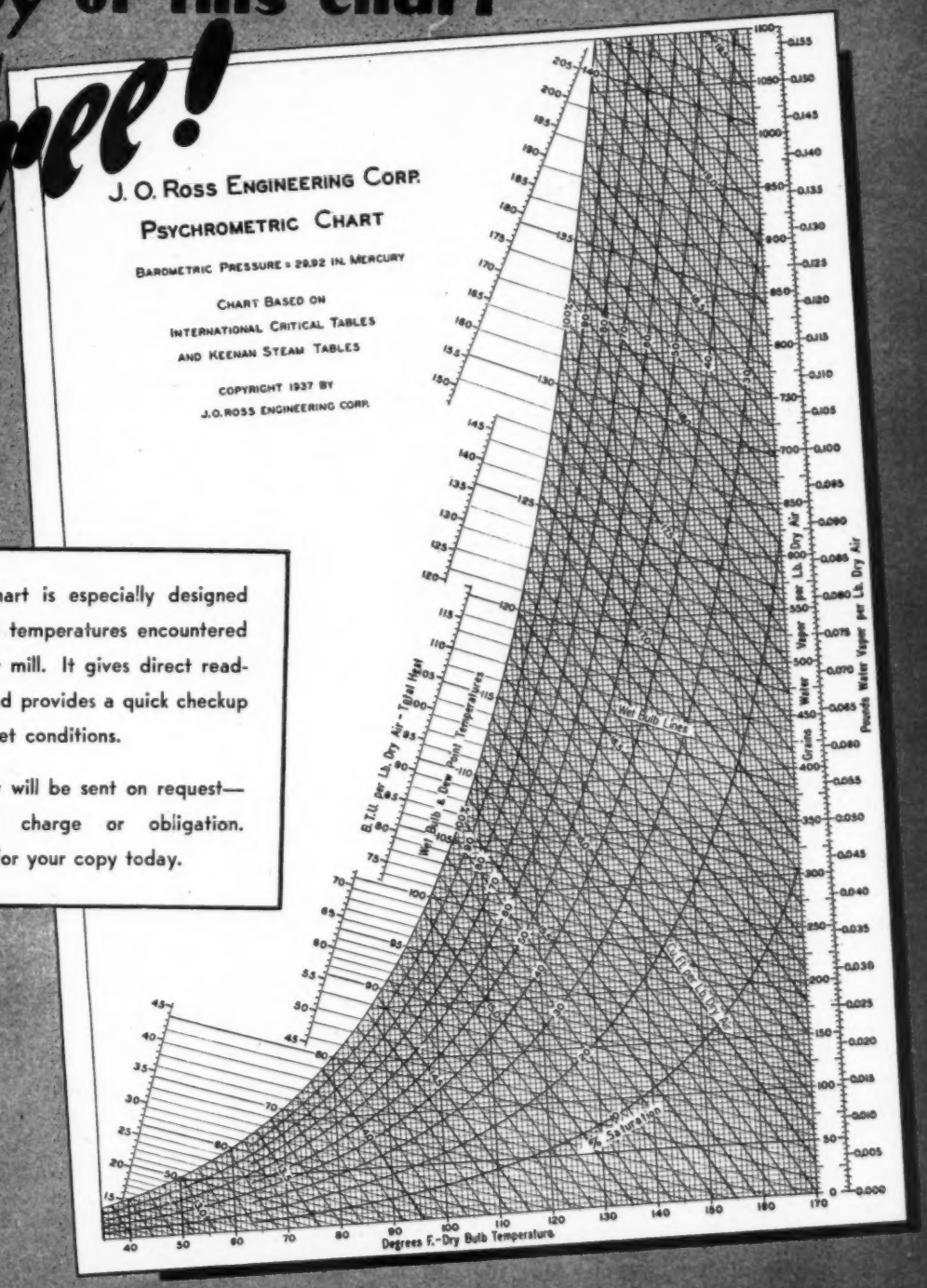
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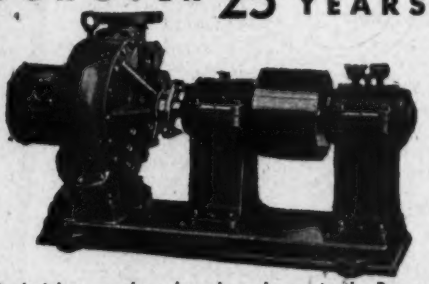

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If you have a beating problem . . . and who hasn't . . . why not talk it over with one of our men? It would involve no obligation on your part and may lead to the kind of production and profits you are daily striving for. Write today.

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Interview and Placement of Veterans

The actual process of reemploying veterans will require more care than is ordinarily given to employment in general. It is emphasized, however, that any special administrative devices should be as inconspicuous as possible since most veterans do not want sympathy nor do they want to be regarded as a problem or even as heroes. We believe, however, that one special consideration can be given them and not appear to violate the above and that is that the president or top executive present, personally greet the former employee and welcome him back.

The first interview will be important to the veteran and should be handled with all the skill possible. A veteran of World War I or even of World War II, if skilled in interview procedure, would be an excellent man to have available. However the emphasis should be on his skill rather than on being a veteran. By all means he —the interviewer—must be thoroughly familiar with all phases of the veteran's rights and privileges given him under the G. I. Bill and Selective Service System.

The interviewer should also be familiar with the company's own policies that may go far beyond the G. I. Bill and the Selective Service Law.

The interviewer should be aware of what the community or state is doing for returning veterans since these organizations may have developed some jobs or plans that are more attractive to the veteran than can be offered by the company. A large number of these local organizations are being set up to assist in the orientation of veterans and already many paper and pulp mill personnel managers are members of the boards of directors.

At this first interview it should be made perfectly clear what the company has in mind for veterans in general and the veteran being interviewed in particular. Additional skills acquired during service can be discussed, his discharge papers examined and his likes and preferences brought to light.

Medical Examinations

Since the veteran's discharge papers will not indicate physical handicaps acquired since his induction into the armed service, a thorough medical examination will be in order. If this examination indicates that the veteran is not able to work at his former job or that he can perform only a limited amount of work, this should be discussed with him in the presence of the doctor.

During this war emergency, a lot has been learned about using handicapped workers and this knowledge should be capitalized and every effort made to fit the veteran into a job that he can handle efficiently. At the same time it can be pointed out to him the various courses open to him under state and federal legislation and his attention can be called to Local Veteran Clinics who will be skilled in retraining handicapped workers.

The doctor who gives the physical examination should be asked to classify the men into one of the following groups, or some similar classification:

a. Can handle any type of work

b. Those affected with some physical or mental disability which makes them unsuited for certain types of work, such as:

1. Hazardous machinery
2. Heavy lifting
3. Work above ground level
4. Dust or skin irritants
5. Extensive walking or standing
6. Noisy work

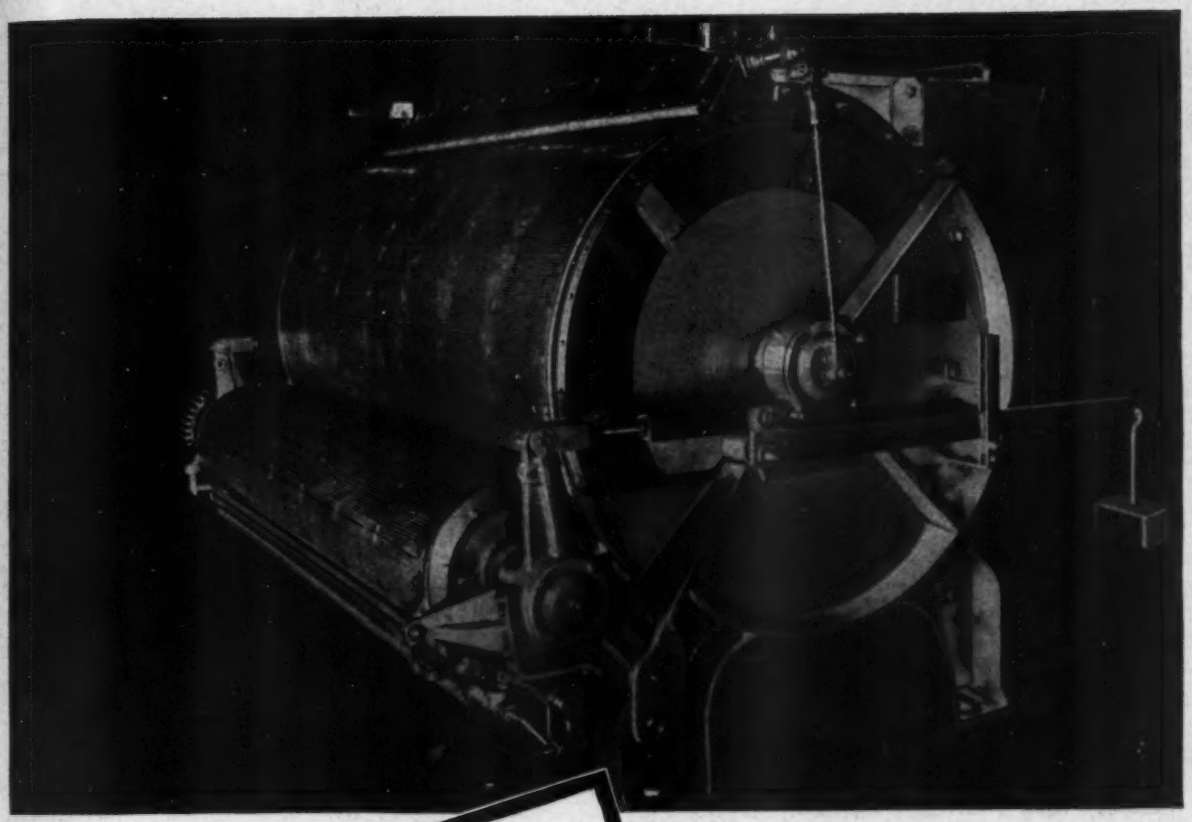
c. Those who have severe handicaps requiring special training or placement

d. Those temporarily unable to work because of a physical condition, such as a contagious disease or tuberculosis

e. Those who require extensive vocational rehabilitation before they can perform any work in the plant

(Note: d and e cases are responsibility of Veterans' Administration and should be referred to them.)

It is suggested that employment officials contact the Local Selective Service or the Veterans' Reemployment Representative in the United States Employment Service Office and ask to see Form 53 on veterans they expect to hire. This form (WD-AGO-Form 53) is supposed to be mailed to them when a soldier is separated and contains such information as branch of service in armed forces, education, civilian occupation, military occupation, cause of separation, type of discharge, etc. The medical record, however, will not be revealed. The veteran will have a copy of



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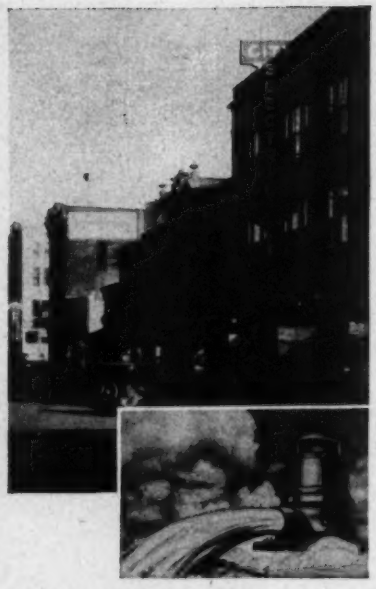

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Form 53 also, but it is well to know about it beforehand since it will make induction that much easier.

Another form (WD-AGO-Form 20) will be found at the same offices and contains even more information than does Form 53.

Placement Problems

If the personnel section plans on following the suggestion of having the doctor classify the veteran's ability into the five or more categories, it is recommended that it prepare for this by classifying the various jobs that fit these categories—such as, jobs that encounter gas or fumes, which require walking, and which are noisy, etc. To have this done ahead of time will simplify matters greatly when the veterans return in greater numbers.

Keeping in Touch with Men In Armed Forces

A great many companies are keeping in touch with their men through house organs and circular letters. Some have written personal letters to each serviceman in which they inform him that the company is looking forward to his return and also inquiring as to the man's intentions, postwar wise, and also as to newly acquired skills. Judging from the replies, these letters have given the servicemen a tremendous lift in morale and feeling toward their company and, of course, it gives the employer a chance for more detailed planning.

Discussion with Union and Foremen

The broad general aspects of the veteran situation should be discussed with the union representatives and foremen so as to acquaint them with the overall picture of veterans' rights and what they as well as management will be expected to do. Individual cases need not be discussed with the union except as circumstances dictate and this will ordinarily be regarding seniority.

Foremen should be schooled on how to handle veterans and usually this "how" is to handle them as though they were not veterans, which may be difficult for some foremen to grasp.

III. POSTWAR EMPLOYMENT CONDITIONS

A. Sources of Labor

1. Displaced War Workers: There is every possibility that there may be a large number of displaced war workers, especially from shipyards and airplane factories, available after the war is over. Many of these will have acquired skills, especially mechanical, and will be useful in a paper mill maintenance department. However the employer's first obligation is to his veterans and such former employees who have been granted a leave of absence for war work.

2. Former Employees: Former employees who have not been granted a leave of absence have no legal or moral right to their old jobs. However, some of these may be highly desirable because of special skills and training and it may be desirable to look out for openings for them. A paper mill with its steady year-round employment will be quite attractive to many such men and after an employer has placed his veterans and those with leaves, he may wish to take on some former employees who left only for higher wages.

3. Veterans Who Were Unemployed Before Entering Service: A great many veterans will return who had no previous employment since they were still in school or otherwise too young. But those former high school "kids" will be men when they return. As many as possible should be encouraged to continue school under the terms of the G. I. Bill, and it should be pointed out to them that this country as well as the rest of the world will need every trained man it can get to mend the damage created during the war.

VETERANS' RE-EMPLOYMENT SCHEDULE
JOBS BELONGING TO VETERANS

Department	**Machine Room**
Job:	First hand, machine No. 3
Now held by:	John Doe Age: 32
	Marital Status: Married
Date given job:	September 1, 1942
Salary:	85c per hour
Belongs to:	Frank Smith
Service:	Navy
Rank:	Machinist's Mate
Age:	28
Marital Status:	Single
Date given job:	July 10, 1938
Date left for service:	September 1, 1942
Salary when he left:	83c per hour

Proposed Disposition of Case:

Move John Doe to Beater Helper or Smith, incapacitated through loss of leg, put on as Employment Clerk $35 per week.

Inside information on POWELL VALVES

From the outside, this small size 200-pound "White Star" bronze Globe Valve looks very much like the same type of valve in other makes. But inside, where it really counts, Powell design and engineering show the results of nearly a century of "know how" in Valve making.

Among its many features are the regrindable and renewable semi-cone plug type seat and disc, especially designed for severe service conditions. The disc is made of "Powellium," a special nickel-bronze alloy developed by Powell Engineering. The seat ring is furnished in a specially heat treated Stainless Steel. Both are highly resistant to corrosion and erosion.

Of interest, particularly to maintenance men, is the fact that this valve can be *repacked under pressure* when wide open. This feature is provided by the machined face on the base of the bonnet which, engaging with the cut-off collar machined on the top of the disc lock nut, positively seals off the pressure from entering the bonnet. An exceptionally wide and deep stuffing box affords generous packing space. The protruding gland, held in place by a large stuffing box nut, also affords an additional guide for the stem.

The ground joint union body-bonnet connection, held fast by a heavy hexagonal ring nut, permits the bonnet to be easily and quickly removed from and re-attached to the body any number of times without impairing the tightness of the connection.

Ample space between the end of the pipe thread and the diaphragm prevents the pipe striking the diaphragm and distorting the seat when screwing the pipe into the body.

The malleable iron *non-heating* handwheel is designed to fit the hand and afford ease in operating the valve.

The complete POWELL Line includes Globe, Angle, Gate, Check, Relief, Y, Non-Return and other types of valves in bronze, iron, steel, pure metals and special alloys to meet the demands of all branches of industry for dependable flow control equipment.

The Wm. Powell Co.

Dependable Valves Since 1846

Cincinnati 22, Ohio

This valve, especially adapted for steam, oil, water or gas lines, is giving long-life, dependable service in paper mills throughout the United States.

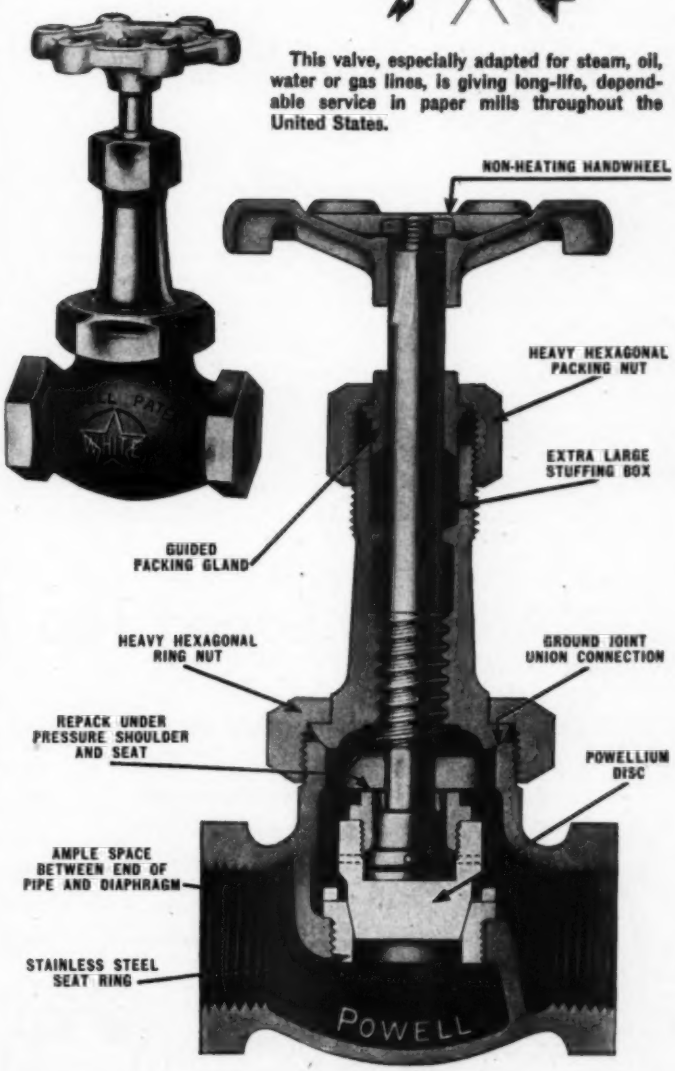

Fig. 1708
BRONZE "WHITE STAR" GLOBE VALVE

POWELL VALVES

However, some will want to go to work and work must be found for them. The paper industry will find a way to take its just proportion.

B. Probable Separation

1. Handicapped Workers: This group of people, many of whom, took jobs as a patriotic measure will be glad in many cases to leave, but others who have acquired skills will be reluctant to do so. They spent long hours in learning their present jobs and by and large they have done well. It's going to be difficult, indeed, to push them out without good reason and it is not our feeling that this should be done, yet this group will eventually decrease in number.

2. Older Employees: Persons of retirement age will, no doubt, want to retire especially if the company has a retirement plan in effect. Others are working only because there is no one to take their place. We believe it would be well to have plant personnel men find out how many plan to stay on after the war so that definite plans can be made for replacement.

3. Women on Men's Jobs: While the industry during war time has found that many jobs formerly considered men's jobs can be performed equally as well by women, it is safe to conclude that post war employment of women will decline to pre-war levels or fairly close to them. The industry had about 7% women employees before the war and it probably will decline from the present 19% to around 8 or 9%.

IV. OTHER PROBLEMS

1. Training: The Committee on Industrial Relations strongly advises that management does not overlook the importance of training. This is especially true in connection with veterans since probably two-thirds of their time in the armed forces was spent in being trained on specific jobs. They are receptive to training methods and will be inclined to follow instructions but will also expect these instructions to be concise and to the point.

The importance of training foremen to handle the veteran situation should not be overlooked. The foremen should be familiar with all phases of the veterans' rights and employers' obligations. He should know and be familiar with the G. I. Bill of Rights and further the company policy that in many cases will go far beyond this Bill.

The foremen must be skilled in training methods, especially as they apply to handicapped workers since this problem must be met fairly and squarely in order that the returning veteran will be given every chance possible to succeed in his job.

2. Veterans' Organizations: Keeping in touch with veterans' organizations sponsored by federal, state and local groups will be a job of no small proportions. The Committee's Secretary will endeavor to keep the industry posted on federal action in connection with veterans but individual plants should take it on themselves to keep advised on local and state activities.

3. Where Layoffs are Necessary: It can conceivably happen that some mills will be forced to lay off employees on account of conditions or to make room for returning veterans and some scheme or plan should be provided for such an emergency.

Companies that are unionized have such a plan fairly well outlined in their union agreements and it may be advisable to discuss and review this plan with union officials.

Companies with no union could well consider some uniform plan and discuss it with their foremen and shop committees. Following is a suggested plan that may be of some assistance in such a plan of retreat:

a. Minors

b. Married women with husbands working

c. Part-time workers

d. Persons of pensionable age

e. Probationary employees (less than six months)

f. New employees (six to twelve months)

This is suggested only and many plants will want to vary it to suit their needs and to play fair with those who have come to their aid in time of need.

A FEW CLARIFICATIONS OF THE SELECTIVE SERVICE LAW (SECTION 8)

1. This law stripped of all legal verbiage states that an employer is required to re-employ veterans of World War II who held a *permanent* job with him before entering the armed forces. It does not apply to those who held *temporary* jobs. Probably only the courts can decide which jobs were per-

Are You Losing Too Many 4/5ths?

Out of every dollar paid out for the expense of Paper and Pulp Mill accidents, only 1/5th (20c) is covered by Insurance. The remaining 4/5ths (80c) comes out of YOUR pocket in INDIRECT costs.

But when you put National Safety Council Accident Prevention Service to work in your plant it will—when properly applied—cut down the Frequency and Severity of your accidents, and, of course, those 4/5th losses which you have been paying for.

The Council's Safe Practices Pamphlet No. 42—"Organizing a Complete Industrial Safety Program" tells exactly what to do and how to do it.

A complimentary copy is available for you—just write on your company letterhead to Paper & Pulp Section—

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NATIONAL SAFETY COUNCIL, Inc.

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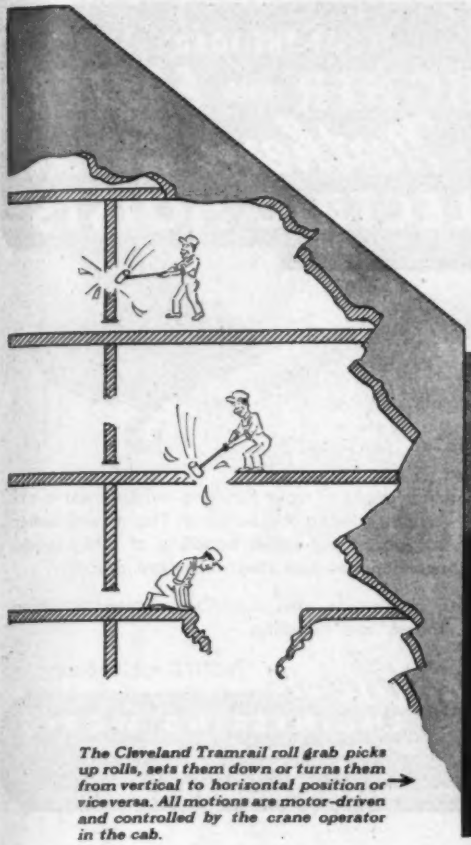
TEAR OUT YOUR FLOORS!

INSTALL A MODERN ROLL-HANDLING SYSTEM



The Cleveland Tramrail roll grab picks up rolls, sets them down or turns them from vertical to horizontal position or vice versa. All motions are motor-driven and controlled by the crane operator in the cab.

If you are struggling with the problem of storing and handling paper rolls in a multi-floor building with low ceilings as illustrated above, we say, "Tear out your floors and install a modern Cleveland Tramrail roll-handling system."

You then will have a single large, light, airy room in which several times as many rolls can be stored as on individual floors. Even if all of your present building is not required for roll storage purposes, you may find it profitable to make this change because of the tremendously increased capacity and the drastic reduction in roll-handling costs.

With a Cleveland Tramrail system, rolls can be stored vertically 42 feet and higher and the entire floor area utilized. Different types of paper are easily stored and retrieved. One man working in the crane cab usually can handle all operations in a large warehouse.

Let a Cleveland Tramrail engineer give you the details.

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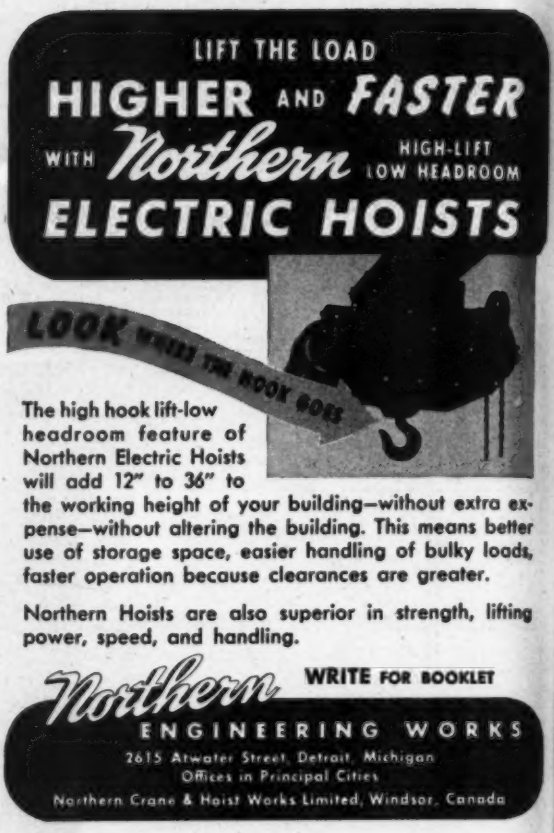
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The high hook lift-low headroom feature of Northern Electric Hoists will add 12" to 36" to the working height of your building—without extra expense—without altering the building. This means better use of storage space, easier handling of bulky loads, faster operation because clearances are greater.
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manent and which were temporary. Generally speaking, one who is employed to fill the place made vacant by a person entering service occupies a temporary status and no reemployment rights even though he subsequently enters service. However, if employee A left a permanent job to join the Army and employee B was upgraded from another permanent job to take A's place and both returned, then both would be entitled to their original jobs.

2. Seniority accumulates during the period of active military or naval service. If a job has been upgraded during the veteran's absence, he must be qualified to perform the duties and functions of that new position. If he cannot qualify, he is nevertheless entitled to a position equal in seniority, status and pay to the one which he left.

3. If during the veteran's absence the employer has entered into a labor agreement setting up conditions of employment, such as, maintenance of membership, check-off, etc., that are different from those which existed when he left, the veteran cannot be deprived of his reemployment rights by reason of these agreements. He has a right to his original status.

4. If the "permanent" employee fails to return or does not want his job back, then it is assumed his replacement becomes the permanent job holder and if in the service, is entitled to the job. For instance, A is the permanent man and goes into the service and is replaced by B. Then B enters the service and is replaced by C. It develops that A is killed or for some reason does not apply for his job in forty days—then B is entitled to the job.

5. Like pay means the rate of the job as it now stands unless the rate has been lowered. For instance, if A was employed at 60 cents an hour when he left and subsequently the job was raised to 70 cents, the veteran is entitled to 70 cents. If the rate on his return was 55 cents, the employer is expected to give him a job paying at least sixty cents per hour.

As stated elsewhere in this bulletin, the main objective is to find jobs for all veterans if physically possible. Many veterans will find themselves in a position of never having had a job and every community must use all the ingenuity at its command to see that these young men and women have something to do in a gainful and pride-giving manner.

THE SELECTIVE SERVICE AND TRAINING ACT OF 1940, AS AMENDED

Section 8

"Public Law 783, 76th Cong., September 16, 1942, as amended by Public Law 360, 77th Cong., December 20, 1941, Public Law 772, 77th Cong., November 13, 1942 and Public Law 197, 78th Cong., December 5, 1943.

"Section 8. * * * Re-employment * * * (b) In the case of any such person who, in order to perform such training and service, has left or leaves a position, other than a temporary position, in the employ of any employer and who (1) receives such certificate, (2) is still qualified to perform the duties of such position, and (3) makes application for reemployment within forty days after he is relieved from such training and service—

"(b) if such position was in the employ of a private employer, such employer shall restore such person to such position or to a position of like seniority, status, and pay unless the employer's circumstances have so changed as to make it impossible or unreasonable to do so.

"(c) Any person who is restored to a position in accordance with the provisions of paragraph (A) or (B) of sub-section (b) shall be considered as having been on furlough or leave of absence during his period of training and service in the land or naval forces, shall be so restored without loss of seniority, shall be entitled to participate in insurance or other benefits offered by the employer pursuant to established rules and practices relating to employees on furlough or leave of absence in effect with the employer at the time such person was inducted into such forces, and shall not be discharged from such position without cause within one year after such restoration."

* * * * * * * * *

Procedure if Employer Fails to Comply

"(e) In case any private employer fails or refuses to comply with the provisions of subsection (b) or subsection (c), the district court of the United States for the district in which such private employer maintains a place of business shall have power, upon the filing of a motion, petition, or other appropriate pleading by the person

for

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entitled to the benefits of such provisions, to specifically require such employer to comply with such provisions, and, as an incident thereto, to compensate such persons for any loss of wages or benefits suffered by reason of such employer's unlawful action. The court shall order a speedy hearing in any such case and shall advance it on the calendar. Upon application to the United States district attorney or comparable official for the district in which such private employer maintains a place of business, by any person claiming to be entitled to the benefits of such provisions, such United States district attorney or official, if reasonably satisfied that the person so applying is entitled to such benefits, shall appear and act as attorney for such person in the amicable adjustment of the claim or in the filing of any motion, petition, or other appropriate pleading and the prosecution thereof to specifically require such employer to comply with such provisions: Provided, that no fees or court costs shall be taxed against the person so applying for such benefits."

Section 11

"Section 11. Penalties.

"Any person charged as herein provided with the duty of carrying out any of the provisions of this Act, or the rules or regulations made or directions given thereunder who shall knowingly fail or neglect to perform such duty, and any person charged with such duty, or having and exercising any authority under said Act, rules, regulations, or directions who shall knowingly make, or be a party to the making of, any false, improper, or incorrect registration, classification, physical or mental examination, deferment, induction, enrollment, or muster, and any person who shall knowingly make, or be a party to the making of, any false statement or certificate as to the fitness or unfitness or liability or nonliability of himself or any other person for service under the provisions of this Act, or rules, regulations, or directions made pursuant thereto, or who otherwise evades registration or service in the land or naval forces or any of the requirements of this Act, or who knowingly counsels, aids, or abets another to evade registration or service in the land or naval forces or any of the requirements of this Act, or of said rules, regulations, or directions, or who in any manner shall knowingly fail or neglect to perform any duty required of him under or in the execution of this Act, or rules or regulations made pursuant to this Act, or any person or persons who shall knowingly hinder or interfere in any way by force or violence with the administration of this Act, or the rules or regulations made pursuant thereto, or conspire to do so, shall, upon conviction in the district court of the United States having jurisdiction thereof, be punished by imprisonment for not more than five years or a fine of not more than $10,000, or by both such fine and imprisonment, or if subject to military or naval law may be tried by court martial, and, on conviction, shall suffer such punishment as a court martial may direct. No person shall be tried by any military or naval court martial in any case arising under this Act unless such person has been actually inducted for the training and service prescribed under this Act or unless he is subject to trial by court martial under laws in force prior to the enactment of this Act. Precedence shall be given by courts to the trial of cases arising under this Act."

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Machine Coated Papers*

P. J. MASSEY, H. P. Smith Paper Co.

Machine coating became commercially important in the United States during the last decade. The success of this commodity was practically instantaneous as it found general acceptance in the printing and publishing fields. The revolutionary change in letterpress printing, the use of heat-set inks, materially aided the sales promotion and exploitation of the machine coated product.

The heat-set method of printing stressed the demand for a paper with a plane surface, brilliant color, high affinity for the inks used and with physical perfection of the paper in rolls that would permit of efficient operation on high speed modern rotary presses.

The successful changes in the formulation of the coating color, improvement through experience of the know-how or technique of application and mechanical changes governing subsequent operations as in supercalendering and rewinding insured the successful acceptance of machine coated paper for publications and mail order insert printing.

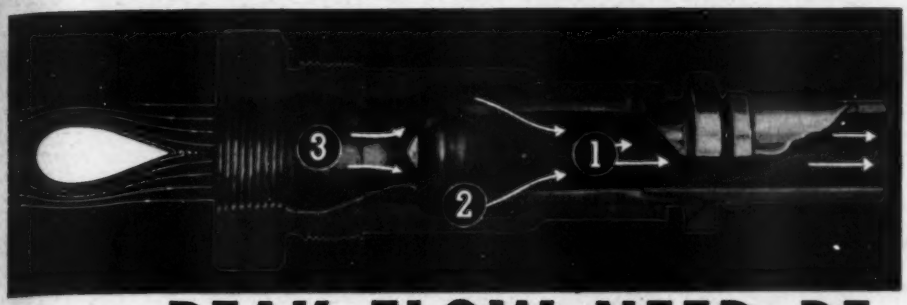
It is an indisputable fact that machine coating has brought about the greatest advance in paper technology in the last half century. The present scientific knowledge and test methods for evaluating printing surfaces and printing materials including inks and plates are directly due to machine coating. It is also the main factor in the success of the important new development in letterpress printing.

Development of Machine Coated Paper

The primary object of machine coated paper development was to provide an economical means for producing a mineral coated paper with a high finish and a plane surface that would give a perfect reproduction of fine half-tone engravings. The coating color applied to such surface had to have ink affinity to receive the ink film and leave a clean plate at each impression. A sheet having these characteristics at an economical cost was in demand by publishers of both magazines and mail order catalogues. The end point of the desire for such a sheet was to enable the printers to produce mono and multi-color illustrations on rotary presses comparable in quality to the products using brush coated papers on sheet feed non-perfecting presses.

The theory or idea of applying coatings and/or various surfacing materials to paper on a paper machine are almost as old as the papermaking art itself. However, the

(*) Paper presented before the October 11, 1944, meeting of the Chicago Professional Paper Group.



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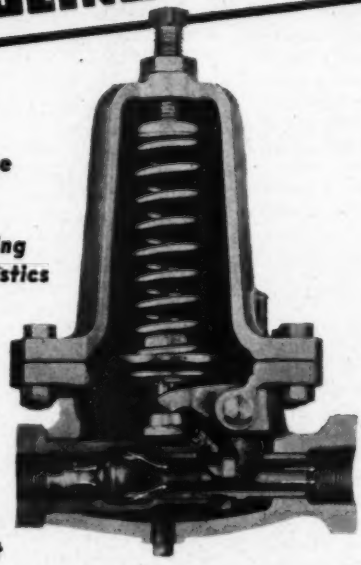
1. Straight Line Flow: Steam, water, air, oil, etc. — flow through this valve in a straight line — nothing is in the path of the flow to cause turbulence — therefore, peak flow is never a problem.

2. Inner valve is streamlined—no back eddies to hinder flow (see the streamlined form above)—valuable when you want all possible fluid to go through the valve to meet peak demand.

3. Turbulence eliminated by venturi approach to the valve seat. This eliminates turbulence—it means better flow. The inlet pressure is confined to a small cylindrical chamber, the same being advantageous for high pressures.



- *Extra large capacity*
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- *Close delivery pressure control*
- *Wide range of adjustment*

Write for bulletin "1000" that fully explains the cost-saving benefits that begin with the installation and last for years.

In giving serious consideration to the possibilities of even smoother operation in your plant, find out how this objective can easily be accomplished by installation of the "1000" valve. For example, there are no complicated parts to get out of order—no small ports or passages to clog up—no close fits. You will get much longer, lower cost service and your attention costs will be down to the absolute minimum. Day after day you will experience smooth operation, accurate regulation, elimination of failures and spoilage.

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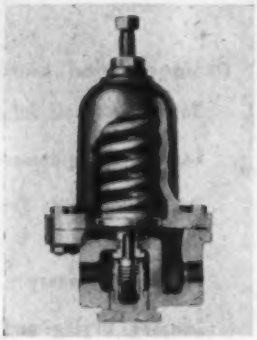
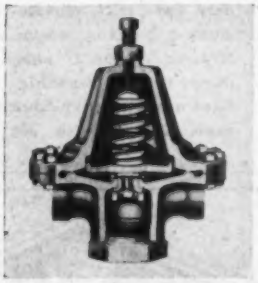
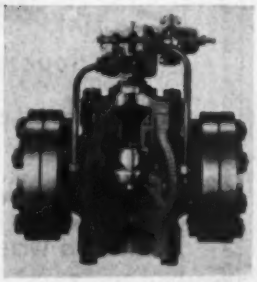


High Pressure Reducing Valve Type H-P; extra heavy for use with initial pressures up to 5000 lbs.; and for reduced pressures up to 650 lbs. Good for most fluids. Sizes: ⅜" to 2"; bronze body; nitralloy trim. Get Bulletin 931.



Type 8871 Pressure Regulator for dirty liquids (like Bunker C fuel oil). Inner valve is bolted to diaphragm for positive movement. Sizes ½" to 10". Bodies: iron, bronze, or steel. Seat ring and inner valve; stainless steel. Bulletin 972.



Cash Standard Type 10 Pressure Regulating Valve, pilot operated. (Pilot operating fluid discharges to outlet pipe; not wasted). Sizes: 2" to 12". Highest pressures: inlet 600 lbs.; reduced 250 lbs. Iron, bronze, or steel bodies; standard trims. For water, air, non-corrosive gases and oils. Get interesting Bulletin 966.

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practical, technical and economic ways and means for accomplishment were not developed until 1930.

At the inception of the process, it experienced all the vicissitudes of a new invention as applied to a conservative industry. When you consider that it was to function for two extraordinary conservative industries, you can get some concept of the difficulties encountered.

Paper mill management tacitly acknowledged the practicability and possibility of the process but was loath to go on record with its board of directors for the necessary capital investment. The main reasons presented for this attitude were: first, that the new process would obsolete investments in the old coating process; second, that there was no demand for mineral surfaced paper not being met by the presently available equipment. Even though the process was proven practical and successful on its own paper machines at the inventors' expense and the finished product readily salable at the going market prices, management did not have the courage to adopt the new process.

The qualities of the new product and the apparent possibilities of its successful exploitation were fully visualized by George W. Mead. He had the courage of his convictions, surrounded himself with all the available elements of success; made the necessary capital expenditures and changes in personnel, and sold the venture to his board of directors, stockholders, and organization. In spite of many technical obstacles that could not be foreseen due to the paucity of scientific information on the physical and chemical constants involved, he prosecuted the development work through to its successful commercial and economic completion. He deserves great credit for having given this valuable advance in paper technology to the world.

A number of serious limitations were encountered at the outset of its commercial operation primarily due to lack of any bibliography or scientific knowledge of not only the process, but also the available raw materials involved. This is readily understandable today as the data and numerical values available covering starch, casein, glue, soy bean protein, clay, titanium, plasticizers, and all other raw materials used in formulating the color or coating are practically new.

Today, the selection and formulation of a coating meeting with any definite specifications including surface value, printing value, ink affinity, flexibility, penetration, brightness, opacity, moisture content, and aging value is standard practice based on definite numerical values.

The successful accomplishment of the vast technical job for the development of fully visual or numerical values of the physical phenomena involved in machine coating and its application is a known fact.

Machine coated paper is established as a definite contribution to the paper industry and the graphic arts. Its acceptance is evidenced by the tonnage consumed today. The demand is limited to the full capacity of the present equipment which has not been expanded during the war period.

The Future of Machine Coated Paper

During the war period, developments in the manufacture of paper have remained static except where the mills' activities were turned from their normal course to meet the needs of the war effort. Machine coated paper (as defined in the accepted sense of the last decade) was not a war necessity, and, therefore, no expansion in equipment was possible.

However, present activities of management in organizing and pressing many research projects for development of machine coating is indicative of a very appreciable postwar expansion as applied to both paper and board. Similar activities are being prosecuted in Great Britain, France, and British colonies.

Probably the most interesting and important general factors governing the attitude and efforts being expended on machine coating are:

A. The possibility of broadening the number of methods or processes without infringement of present patents by taking advantage of the improved technology now available.

B. The desire to expand the process applications to light weight kraft, envelope, food wraps, and other converter paper, folding box, container board, and other board mill products.

C. Preparing to meet the increased demand for printing papers and to meet the requirements of the new postwar printing presses.

D. Necessity of the older mills to anticipate postwar conditions and produce lines that will permit their existence in the new economy.

E. The gradual exhaustion of pulpwood in some paper producing centers which necessitates increased use of clay and other minerals as pulp extenders to balance the productive capacity.

F. The program of our southern mills to improve and expand their activities for producing quality printing and specialty papers.

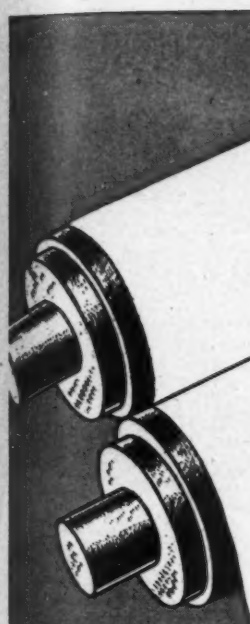
G. The trend to follow the herd instinct and stampede to machine coating as a panacea for any and all ills.

Indicative of the efforts being expended by management on machine coating to prepare their mills for the postwar impact of this activity on their sales is the information compiled by Dr. C. J. West of the Institute of Paper Chemistry. In his bibliography, he reports that in the five-year period, from 1939 to 1943, inclusive, 42 paper coating patents were issued in the United States.

The principles involved in the various types of machine coating equipment cannot be covered in detail in a general treatise of this nature. However, in order to present some concept of various machine coating processes, they are herewith presented in a functional grouping consisting primarily of two types.

Type I—Roll Coaters

This equipment is based upon the premise of preparing a preworked film and applying said film to the continuous web of



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Paper machine coaters, using starch, as an adhesive, find NOPCO 1400-B (Ammonium Stearate) an effective ingredient.

They like it because it helps to prevent dusting,—imparts water repellency,—and eliminates the necessity of washing calender rolls so often. They like it, too, for its absolute uniformity,—its excellent solubility,—its dependable quality. In short, NOPCO 1400-B is an Ammonium Stearate that gives satisfaction!

Our production facilities enable us—at least for the time being—to provide ample supplies to meet the fast-growing demand for Ammonium Stearate. But see for yourself. Order enough NOPCO 1400-B for a thorough trial. Write, wire, phone or use the coupon.

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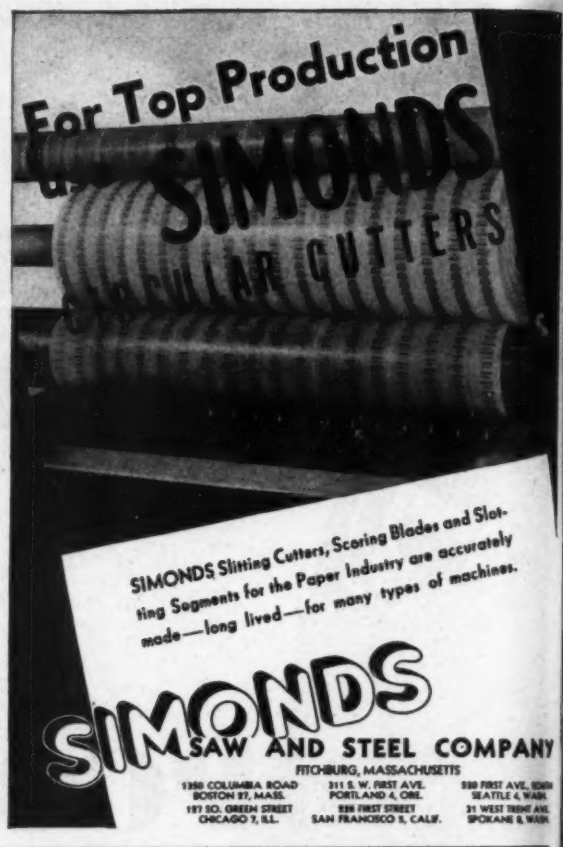
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paper in its course of travel on the paper machine.

Class A—The basic patent involving this principle covers a multiple number of rolls. Two of the rolls act as metering rolls where the coating material is carried. Mechanism provided with micrometric adjustment and peripheral variance in speed between these two rolls produces through the shearing action a film of coating of predetermined thickness. The additional rolls, one or more of which may be provided with an oscillating mechanism to prework the clay to a perfect continuous film. The prepared mineral coating film is transferred to the traveling web of paper by the last two rolls in the chain. A number of variations of this basic principle have been evolved and may or may not be factors in the postwar expansion of machine coating.

Class B—Intaglio roll coaters involving the idea of a preworked and/or premetered film based upon some type of indentation in the metering roll with a doctor to level the material is the basic principle in coaters of this class.

This intaglio method applies the metered coating retained in the indentations or wells either to the paper web direct or indirectly by transfer to a rubber roll.

The intaglio method is inflexible as the quantity is fixed by the depth of the indentations or wells of the doctored roll. The printing value of the cast film, transferred or offset, is still questionable in fine halftone or rotogravure printing.

Class C—The size press type of coater consists of two or more rolls in a vertical position. The nip between the rolls meter the coating onto the paper web as it passes through the nip.

As its name indicates, this class of coater is similar to the means used for applying size to bond and other papers on a paper machine.

Considerable effort has been expended in improvements in design and mechanization of this principle and it may be a factor, to a limited extent in the postwar machine coating program.

Class D—Representative of this class is the suction roll type of coater predicated on the principle of the suction roll on a paper machine.

This process has possibilities but as yet has not been fully perfected to operate at the widths and speed of a modern paper machine.

Type II—Trowel Coaters

This type of coater is premised upon dispersing, smoothing and evening the coating after it is applied to the paper web.

Class A—The oldest class of this coating type is the conventional brush coater wherein the coating was smoothed or troweled by reciprocating brushes.

Class B—The spray coater with a rod or roll doctor to even or smooth the coating after it has been sprayed on the sheet is illustrative of this class.

Spray class coaters have been given as much if not more attention by inventors than most any other class. The apparent simplicity, plus the widespread application of the air brush principle to paint application has undoubtedly motivated this activity.

With the possible exception of fancy wrappings, I do not know of any successful economic operation of this class as machine coaters. Perhaps, with the intensive efforts being put forth in spray coating, some measure of success may be accomplished in the future.

Class C—The Doctor Coater

C-1 Consists of a roll applicator to deliver the coating material on the paper web and a stationary doctor blade with curvature and surface to properly spread or trowel the applied coating.

C-2 This class uses similar applying means for placing the coating on the paper web, but the evening or troweling operation is performed by an air jet operating on the full width of the web. The air pressure being the means for leveling instead of a mechanical doctor.

C-3 Consists of a roll applicator running at controlled variable speeds at variance to the peripheral speeds of the paper web with which it makes contact controlling thereby the quantity of coating on the web. The web is then passed over a wire to smooth or trowel the applied coating. The speed changes of the color applying roll plus the variance in diameter of the wire give a wide elasticity to quantities applied.

What's the V.Q. on your lines?

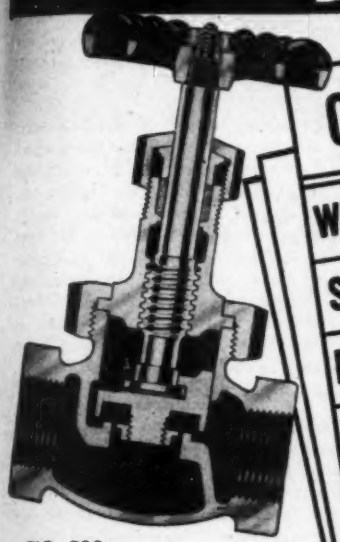

FIG. 520

What's the Valve Quotient on your steam, water, oil and gas lines?

Take, for example, a one-inch Union Bonnet composition disc Globe valve-OIC Fig.No.520.

With this valve your V. Q. is higher than with other valves . . . on steam working pressure rating, it is 133%.

Prove it to yourself. On this handy check sheet, showing OIC specifications, just make the comparison.

There is an OIC Distributor near you, ready to help you check your V. Q. Call him or write us for details on OIC Bronze, Iron and Steel Valves.

CHECK SHEET	OIC	OTHER
WEIGHT 1-Inch Fig. No. 520	4 lb. 5 oz.	
STEM DIAMETER	33/64"	
END-TO-END MEASUREMENT	3-7/8"	
DIAMETER OF HEX (Across Flats)	1-13/16"	
WIDTH OF HEX	9/16"	
WEIGHT OF DISC & DISC HOLDER	4-1/2 oz.	
WEIGHT OF BONNET NUT	8-3/4 oz.	
DIMENSIONS OF CONDENSING CHAMBER	13/16" Dia. 27/64" Deep	
STEAM RATING	200# WSP	
LIST PRICE	$6.60	
V. Q.		

VALVE QUOTIENT

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OIC

C-4 This operation consists of applying the coating to the paper web and then compacting same with the aid of pressure from one or more rolls to a large diameter highly finished chromium-plated dryer roll. This compacting of the malleable coating to the hot smooth dryer produces a high, finish plated surface similar in appearance to a glazed paper surface.

Raw Materials

The successful accomplishment of the technical job to develop the raw materials for the economical operation of machine coating was in a large measure due to the wonderful co-operative effort of the clay, adhesive and other raw material suppliers. All of the units involved, either on the producing or supplying ends of this activity, are deeply indebted to the electron-microscope. Without this instrument, processes for classifying clays into various micron size groupings and evaluation of printed surfaces would not have been possible.

Minerals, Clays, etc.

To the clay producers, more than any raw material supplying agency, we are indebted for the success of machine coating. Their research and development work resulted in large capital outlay for installing new processes for clay treatment and classification into various grades having definite micron size and distinctive physical properties.

Adhesives

The adhesive suppliers also gave material assistance in development of machine coating. The study of new treatments of starches, casein, soy bean, protein, and other adhesives to adapt them to machine coating and the co-operative efforts for developing special compounding techniques by the adhesive suppliers materially helped to achieve successful formulations.

Raw or Body Stock

The comparatively recent studies of printing surface phenomena has focused attention to the importance of the base stock used in machine coating. It has been definitely proven that the pulp, clay and other ingredients of the body stock have a very important influence on the physical properties of the finished coated sheet. This applies especially to the printability values.

The printing values of cellulose fibers vary as to the species of wood from which the pulp was produced. It was found that this variance does not follow the former concept of the coniferous woods, such as spruce, being superior to the hardwoods as many species of hardwoods furnish pulps with high printing values. The Cinderella of papermaking fibers, groundwood, lends superlative values to the printability of machine coated paper especially in cushion and take off values.

Conclusions

Probably the most interesting and important general change for machine coating in the future will be the expansion in number of installations. There will undoubtedly be a number of processes now being experimented with that will be successfully and economically used on a commercial scale.

This postwar expansion in machine coating will not be confined to the application of clay coatings but will expand to the coating and treating of papers with resins and other plastic materials to impart various desired physical properties to the paper.

Further depletion of our fibrous resources and competition for the available pulp from the chemical and textile industries will give a further impetus to machine coating as being the most ideal method for use of clay and other minerals as pulp extenders.

The picture of the future for machine coating will be exceedingly bright providing its exploitation is conducted sensibly and with careful planning. Unrestrained "free enterprise" which might easily mean a blind stampede into this type of paper manufacture would definitely be disastrous to the economy of both the industry and the country. We should profit from our newsprint and southern kraft experience and avert a repetition.

It is my personal belief that the chief factor in the productivity of our industry today and the miracle it is performing under present critical conditions is our co-operative effort with "government" agencies. We are all working hand in hand with these "government" agencies which in reality are our agencies. Through this co-operation, under the pressure of war and pulp scarcity, we have all arrived at

STICKLE DRAINAGE AND CONTROL

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• The difference between the actual production volume of a paper machine and its potential or possible production capacity, represents the factor of inefficiency. A reasonable percentage of this factor of inefficiency must be accepted in establishing production quotas, to compensate for both human and mechanical elements beyond absolute control.

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Here are some of the reasons why Stickle Drainage and Control Equipment increases production volume and improves quality: (1) Positive and effective elimination of condensate and air at all pressures. (2) Regulation of steam flow to immediate need of dryers. (3) Drying control extremely sensitive to variations in weight or free and slow drying stocks. (4) Control of moisture content within a variation of one-half of one per cent. (5) Visibility of operation gives exact knowledge of operation of each dryer syphon. In addition to giving higher production and improving quality, Stickle Drainage and Control saves steam, increases boiler capacity, and reduces fuel costs.

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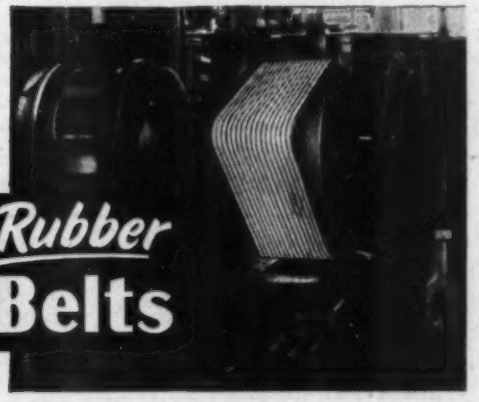

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Now that every V-Drive in your plant depends upon belts made of synthetic rubber it pays to know that Gates Synthetic Rubber V-belts have been in nation-wide use for *more than 6 years*—and through all that time they have been giving service actually superior to belts of *natural rubber!*

There is naturally a reason for this marked superiority of Gates synthetic rubber belts—and here it is:

Gates began making large quantities of belts entirely of synthetic rubber long before synthetic rubber came to be thought of as merely a *substitute* for natural rubber. Gates used synthetic rubber not as a substitute but as an *improvement*— in fact, Gates chose a very *special* synthetic for the one reason that it is, in many important respects, *greatly superior* to natural rubber.

*There are, of course, many kinds of synthetic rubber. Gates uses each kind where it best meets some particular service need.

For Example:—One special synthetic rubber which Gates uses extensively in making V-belts has the ability to withstand oil and heat much better than natural rubber can. Where oil and heat conditions are especially severe, Gates special synthetic V-belts are giving 3 times to 4 times the service life of any natural rubber V-belts ever used.

This is the record not of a few belts over a limited period but of thousands upon thousands of Gates synthetic rubber V-belts installed in hundreds of plants and factories during the past 6 years.

Gates long headstart and outstanding success in making V-belts of synthetic rubber is of greater importance to you now than ever before because the entire operation of your plant today depends so largely on synthetic rubber V-belts.

You will gain a distinct advantage in V-belt service and operating efficiency by picking up your telephone directory and calling the Gates Rubber Engineer. (Just look under the heading "Gates Rubber.") He will bring right into your plant the full benefits of Gates' knowledge and experience —without the slightest obligation.

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a better understanding of our obligations to our industry and to the general economy.

The "government" agencies are manned by our own men who know our business and have the interest of the industry as a whole at heart when they issue directives and rules for our guidance and neither the agencies nor the industry are conscious of bureaucracy.

Practices formerly forbidden are now not only permitted but directed and enforced. Patents, know-how and trade secrets are being exchanged, and cut-throat competition has disappeared.

If we continue such an agency after the War and implement it with positive and constructive powers for the orderly increase in production and employment, machine coating and other constructive developments for the further expansion and improvement of our industry will be assured of successful accomplishment.

Convention Papers . . . Abridged

This is the sixth installment of abridgments of papers presented at the annual meeting of The American Pulp and Paper Mill Superintendents Association, held in Chicago, May 24-26, 1944. Another installment of these abridgments will be published in an early issue.

Paper vs. Electronics

A. J. GERMAIN and R. R. BAKER
Westinghouse Electric and Mfg. Co.

Many years ago Westinghouse recognized the need in the paper industry for a speed regulation device for the paper machine that would provide the close speed regulation so necessary for the production of a uniform product. Prior to that time, many different regulating devices had been used, all adapted from existing designs, developed for the exacting requirements of the paper machine. The regulator had to be designed to respond quickly and accurately to changes in load, due to the changing of press weights, the adjustment of doctor pressures, changes in vacuum, or any other of the variables that would effect the speed and hence the uniformity of the finished product. For meeting these requirements, the regulator must be dependable and requires a minimum of maintenance. The answer was found in electronics.

The electronics tube regulator is entirely automatic in operation. It functions without time delay or mechanical inertia. There are no moving parts, no friction; corrections in speed are swift and sure. In this application, the electronic tube performs the functions of amplification and controlling. An electronic tube device amplifies the impulse first detected by the pilot exciter and instantaneously applies corrective forces through other electronic tubes.

On sectional electronic drives too, electronic regulators have been in successful operation in a number of mills. In this case, the regulator is similar in general design to the single motor drive speed regulator excepting that it functions as a voltage regulator to accurately maintain the voltage of the main generator and all of the individual section motors. In this application, two regulators are used for each drive, one for maintaining accurate exciter voltage and the other operating in the main generator circuit.

Many motor drive problems, particularly those connected with converting machinery, slitters, winders and packaging machinery, are best solved by the characteristics inherent in a shunt wound d-c. motor. The most universal availability of a-c. power and relative unavailability of d-c. power has made it much more difficult to use the desirable d-c. motor for those drive applications requiring adjustable speed over relatively wide speed range. There has also been a growing desire for a greater nicety of control that can be readily obtained even if a d-c. system is available. An electronic control has now been developed which operates a d-c. motor from an a-c. line and has additional desirable features not previously available. The electronic adjustable speed drive consists of a d-c. shunt wound motor whose field and armature are energized by separate thyratron rectifier circuits. These rectifiers are so controlled as to vary the input to the motor, regulate the motor speed to a preset value, and limit the maximum current furnished the motor during acceleration and reversal.

The control permits smooth stepless adjustment of motor speed over a range of at least 20:1 below the base speed of the motor, and over an additional field control range of as much as 4:1 above the base speed of the motor. This speed control is readily obtained over the full range below and above basic speed by means of a small dial located in the pushbutton station convenient to the operator.

Combined with the wide range of speed control is the very flat speed-torque characteristics over the whole range. This is obtained by speed regulating circuits which insure that the motor will be held to the preset speed chosen by the operator. In a properly adjusted system, the speed over a 10:1 range below basic speed will not vary more than four per cent from a preset value with torque varying from no load to full load, nor will it vary more than eight per cent for any speed within the speed range of 20:1. Normal variations in a-c. voltage have only a small effect on the speed regulation.

A photoelectric cell or electric eye, in combination with an electronic tube has been used frequently to signal or record a wet end break. No mechanical device touches the sheet, but instead, a beam of light is focused on a photocell in such a way that when the sheet is intact, it prevents the light from reaching the cell.

If a break occurs, the light strikes the photo-tube and an electronic tube amplifies the electrical impulse thus generated, to light a signal lamp or sound an alarm. This instantaneous signal saves time in re-establishing the sheet and also enables the operator to release the calender weights before the tailings can mark the rolls.

A regulator used frequently in paper, cellophane, and glassine processing, is that for maintaining the position of cut when taking from a roll of preprinted stock for making bags or packages. Although the machine feeds paper at a rate approximately correct to match the speed of the rotating knife, the cut will never remain registered perfectly without either manual or automatic supervision. A register regulator corrects for changes of paper slippage, stretch, and speed relative to the cutter speed. The

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If you have any process that can be handled better or more economically in PYREX Piping, you can safely take the advice of these users . . . and cross out the problem of breakage. For further proof of what PYREX Piping can do for you, write Industrial Sales Dept., PI11, Corning Glass Works, Corning, N. Y.

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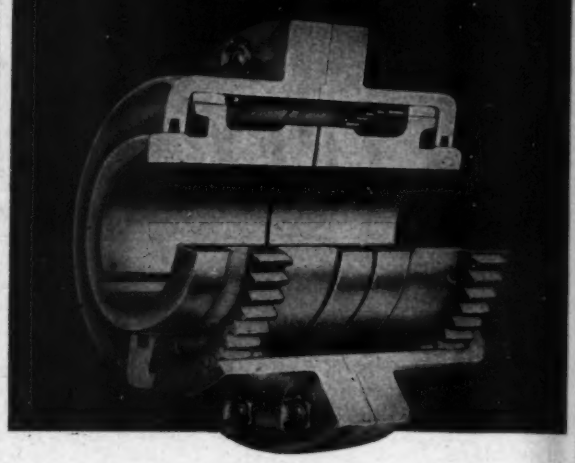

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FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

position of the printed material is indicated by a rectangular register mark in the design or margin which is scanned by a phototube. The position of the mark with respect to the cutter is checked and the speed of paper feed modified if necessary.

When slitting strip material, it is often necessary to regulate the sideways position of the web to insure cutting at the proper point relative to a trade-mark of printed design. The slitter regulator scans the edge of the paper web or a line in the printed design. The proper web position is obtained by moving the roll of material to the position called for by the phototube in the scanning device. The same device is used to scan the edge of a web and correct the roll position to insure smooth roll wind-up when rewinding mill rolls.

The application of phototubes to sorting problems is usually very expensive because of the considerable development involved and many times cannot be justified for that reason alone.

Many applications for photoelectric control can be taken care of by general purpose devices called photoelectric relays which may be considered as light sensitive limit switches. These are available in varying forms and at varying prices, depending upon the desired sensitivity and functions to be performed and can be adapted by the purchaser to his own application. These include counting, drinking fountain control, door control, and conveyor control and many others known only to the many users.

Conversion of electricity from one form to another in a simple way was found in the "Ignitron", another electronic development of considerable merit.

Ignitron Rectifiers introduce a basically new principle in the utilization of the rectifying property of the mercury vapor arc, which greatly increases the efficiency of power conversion in the 250-900 volt range. Under this new principle, it is possible to design a rectifier which more nearly approaches the theoretical efficiency of the mercury arc.

The Ignitron principle provides a method of starting an arc reliably in a few microseconds. This method of starting an arc is based on the fact that when current is passed between a high resistance and low resistance material in contact, a gradient may be set up at the junction sufficient to create a cathode spot. This method is amenable to synchronous application. With such a system of ignition, the arc may be permitted to extinguish at the end of each conducting period. This leaves the anode surrounded by a de-ionized gas during the time that it is bearing a reverse voltage. Of course, in order to take advantage of this method of operation, each anode with its own cathode is mounted in a separate chamber, thus removing it from the influence of other anodes when they are conducting current. This permits a reduction of the shields and grids to the minimum necessary to take care of the transition periods and permits the location of the anode close to the cathode with a consequently low arc-drop.

Electronics now is offering for your consideration a method of applying heat uniformly in your products, instead of the older method of from the outside in.

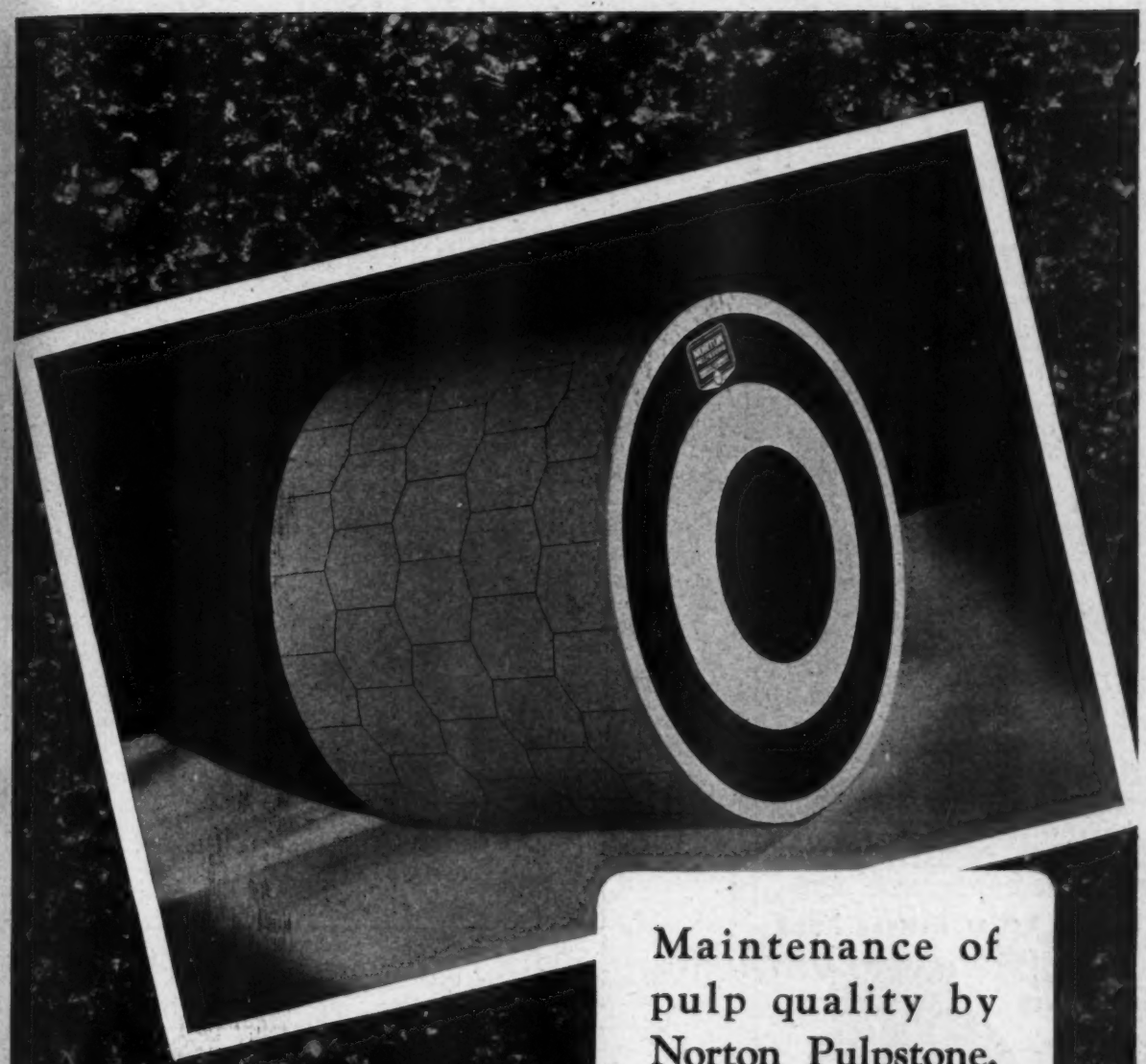
The characteristic advantages of high-frequency heating are (1) rapid and readily controlled rates of heating, combined with (2) the ability to generate heat within the work itself. These make possible faster rates of processing and more uniform and better products.

High-frequency heating has a multitude of applications. There are two methods commonly employed at the present time: Heating metallic materials by a process known as Induction Heating. Heating non-metallic materials by a process called Dielectric Heating.

Dielectric heating differs from induction heating in that it has the ability to generate heat within non-metallic materials. It can be applied to the production of plywood, wallboard, impregnated wood, to cure rubber, thermosetting plastics and heat thermoplastics as well as many other heat-formed materials. It has the advantages of providing uniform heat throughout the product, without injury to the finish or structural qualities, generally increasing its strength and often cutting production time from hours to minutes.

Moving into the present we find ourselves with an array of mechanical devices initiated, guided and/or controlled by tubes (both metal and glass), representing the brain of all electronic mechanisms.

If we continue to look upon and use electronics as a *function* of electricity rather than an apparatus, the benefits to accrue will be great indeed.



Maintenance of pulp quality by Norton Pulpstone. Uniform uninterrupted production was never more important than now.

◆ ◆ ◆

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Worcester, Mass.

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Effect of Chip Length on Quality of Wood Pulp

BRUCE SUTTLE
Herty Foundation Laboratory

The effect of variation in the length of chips used in the manufacture of pulp from Southern Pine by the sulphate process has been a matter of divergent opinions among pulp mill superintendents. The Herty Foundation Laboratory has made a series of twenty cooks, cutting chips to exact length from ¼ inch to 1½ inches in length, with all factors constant except the varying length of the chips.

The pulp stock from the ½ inch chips washed much cleaner and quicker than the one inch chips. All stock was screened through 0.009 inch flat screens. Some shives showed up in the pulp from the one inch chips. Stock from the ½ inch chips was very clean with practically no shives.

All cooks were made in a ten pound pilot digester using indirect circulation. Chips were cut from regular mill run of green Southern Pines. Logs averaged from four to twelve inches in diameter.

All tests were made according to the TAPPI standard methods. Hand sheets were conditioned according to the TAPPI standard T 402 m42 (65% R.H. and 70 Fahr. for 24 hours).

Effect of Chip Length on Quality in Sulphate Pulping
(Factors Constant)

Cook	Chip Size (in.)	Yield (per cent)	Screen (per cent)	Burst (per cent)	Tear (per cent)	Freeness 00.	KMnO No. 4
CS # 1	¼	40.8	00.1	145.5	250.5	350	14.4
CS # 2	¼	41.0	0.2	144.8	255	360	14.6
CS # 3	½	42.0	0.2	150	285	370	15.8
CS # 4	½	41.8	0.3	155	290	375	15.6
CS # 5	¾	42.5	1.0	148	285	380	16.8
CS # 6	¾	42.0	1.2	146	288	390	16.4
CS # 7	1	42.6	3.0	142	286	390	18.0
CS # 8	1	42.0	2.8	143	280	385	17.9
CS # 9	1¼	43.9	3.8	141	275	385	19.4
CS #10	1¼	44.0	3.5	140	274	380	19.6
CS #11	1½	44.8	4.0	139	270	395	21.0
CS #12	1½	45.0	3.9	142	260	385	21.6
CS #13	½	42.0	0.3	150	288	375	15.8
CS #14	½	42.4	0.2	152	292	370	16.0
CS #15	½	42.6	0.4	148	295	380	15.6
CS #16	½	42.3	0.2	156	294	375	16.2
CS #17	1	43.0	3.0	140	286	390	18.4
CS #18	1	43.0	3.0	140	286	390	18.4
CS #19	1	43.1	3.8	146	279	408	18.8
CS #20	1	43.4	3.4	140	284	405	18.6

Active Alkalinity, 20%
Sulphidity, 30%
Time to Maximum Pressure, 1¾ Hrs.
Time to Maximum Temperature, 1¾ Hrs.
Cooking Time, Total, 3 Hrs.
Maximum Temperature, 175 C.
Maximum Steam Pressure, 115 psi.
Beating Time, 65 Minutes

Clays

DR. C. G. ALBERT
Edgar Brothers Co.

However uniform a clay might be, this uniformity alone could not guarantee uniform behavior of coating colors nor uniform quality of a finished coated sheet. Nevertheless, the fact that clay is the predominant ingredient, on a dry basis, of most coating colors makes uniformity of the clay essential for best results.

The ideal clay should be uniform with respect to pH, viscosity, and general hydrous characteristics in order to permit uniformity from the standpoint of application of the coating. At the same time, the ideal clay, from the standpoint of quality of the finished sheet, would be free from any variation in color, in its ability to impart finish to the sheet, in adhesive requirements, and in behavior toward printing inks.

Since clays, as they occur in deposits, do not meet these requirements, it is one of the aims of the refining processes employed to provide a closer approach to the ideal coating clay.

The simplest refining process used in clay production is air-floating—the crude clay is simply dried, pulverized, and air classified. Some of the impurities which are highest in specific gravity and most resistant to the action of the pulverizer will be eliminated. With this exception, the clay remains much as it was in the deposit—and the non-uniformities persist.

Waterwashing of clays makes possible a more efficient removal of impurities and a somewhat greater uniformity since the flow of the clay slip in and out of tanks and through the troughs used results in a certain degree of blending.

Neither of these processes has been found sufficient to produce clays of quality and uniformity adequate for modern coating requirements. Instead, it has been found necessary to control the particle size of coating clays by fractionation while in a deflocculated condition; to control *p*H by subsequent chemical treatment; and to improve and control color by chemical bleaching treatments.

At various points during the processing of clays of this type, there is, in addition, a chance to still further iron out irregularities in the crude clay by wet blending. The progress of the clay slip through the

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•

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And the best thing you can do for your own sake, brother, if there *should* be a depression ahead, is to get your finances organized on a sound basis of paid-up debts—and have a little money laid by to see you through!

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3. Keep your *own* prices down. Don't take advantage of war conditions to ask for more—for your labor, your services, or the goods you sell.
4. *Save.* Buy and hold all the War Bonds you can afford—to help pay for the war and insure your future. Keep up your insurance.

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A United States War Message prepared by the War Advertising Council; approved by the Office of War Information; and contributed by this magazine in cooperation with the Magazine Publishers of America.

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operation involves numerous passages through pipes and troughs as well as repeated pumping into and out of vats and tanks of various sizes. These operations tend to blend and blend again fairly large quantities of clay, with a resulting increase in uniformity of the product. Blending in the vats is especially helpful in this regard. After the clay has been dried, further blending becomes more difficult and less efficient, so that the clay as it approaches the dewatering operation must show something approximately the desired uniformity if that uniformity is ever to be attained.

After the processing is complete, some additional benefit will result from blending of clay in storage. Storage of large enough quantities of clay in piles or bins or preferably in silos will produce a certain degree of blending as the clay is removed from the bottom and the clay at the top changes its position.

Clay consumers who use clay in bags, or those bulk users whose storage space is small, can do little or nothing to help themselves with regard to clay uniformity and must depend entirely upon their supplier. Consumers, on the other hand, who can carry a considerable inventory of bulk clay gain by a certain amount of reblending in storage which will be somewhat dependent upon type of storage space. Thus, any remaining variation in individual shipments tends to become equalized.

The fact that sampling methods are important is in itself a tacit admission that uniformity is something short of perfect. If conclusions are to be drawn on laboratory tests on small samples, these samples must of course be representative. A cumulative sample representing all portions of the shipments should be gathered and then blended and quartered by standard methods to obtain a test sample of suitable size.

Utilization of Less Commonly Used Species and Waste and the Improvement of Yield in Pulp Manufacture

M. W. BRAY, E. R. SCHAFER
and J. M. McGOVERN
Forest Products Laboratory*

The pulp and paper industry is now faced with the dilemma of supplying sufficient pulp to meet an ever increasing demand while pulpwood production is not keeping pace with requirements because of the shortage in woods-labor and transportation facilities. Mill operators are greatly concerned about this problem, and no doubt some have given a great deal of attention to ways and means of overcoming it by such expedients as: (1) utilization of whatever species are available at the mill; (2) Improvement in pulp yields; and (3) waste utilization.

The key to maintaining sufficient supplies of pulps for all purposes appears to lie largely in sulphate pulp, of which there is a growing shortage.

Formerly the chief raw material used by the pulp and paper industry consisted largely of coniferous or softwood species (the spruces, pines, hemlocks, and firs). Only a relatively small percentage of hardwoods or deciduous species were considered for pulping, and many of the hardwoods were classed as "nonpulping." Increased pulp production through utilization of all available species, hardwoods as well as softwoods, is a factor that should be given much consideration. Further, little use has been made of logging and mill wastes.

Fortunately the hardwoods offer a number of advantages to the pulp mill operator. Since many of the hardwoods exceed the softwoods in density and in cellulose content as well, they possess the possibility of increased yields of pulp per cord. Further, hardwood pulps can be used advantageously in many products by blending them with the longer-fibered pulps to give improved sheet properties. Aside from their short fibers, one of the main disadvantages of hardwoods is the difficulty encountered in removing the bark except during the peeling season. Some mills, however, have found that although digester yields from unpeeled wood are lower than those from peeled wood and chemical consumption higher the bark offers no great obstacles in pulping even for the production of bleached pulps for the higher grades of paper. Utilization of wood with the bark on has the advantages that the wood may

(*) Forest Service, U. S. Department of Agriculture, maintained at Madison, Wisconsin, in co-operation with the University of Wisconsin.)

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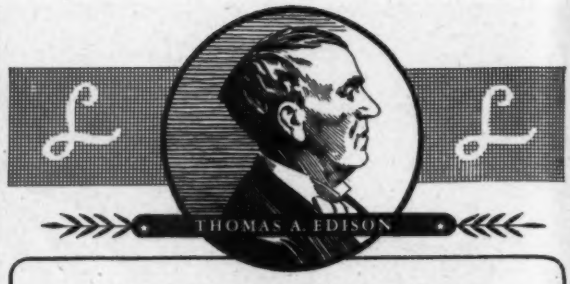

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be cut at any time of the year and that some pulp is obtained from the bark itself.

With the objective of broadening the base of raw materials for pulping, the Forest Products Laboratory has conducted extensive pulping experiments on a wide variety of hardwood species by the several commercial processes, pulping them in various mixtures with softwoods as well as individually. In general, the results of all these experiments have shown that, although the hardwods are reduced with varying degrees of reluctance, so far as the soda and sulphate processes are concerned, there are no "nonpulping" species.

The results have also shown conclusively, both as to rate of pulping and as to yield, strength, and bleach requirements of the pulps, the superiority of the sulphate process over the soda process. Even low sulphidity liquors in the range of 5 to 10 per cent of sodium sulphide, result in noticeable improvements in both yield and pulp quality.

To illustrate the possibility of pulping mixtures of hardwoods and coniferous species, southern yellow pine chips were mixed with an equal weight of hardwood chips. The hardwoods used included sweetgum, black willow, southern cottonwood, American elm, sugarberry, green ash, and bitter pecan. The several mixtures of chips were pulped by the sulphate process under conditions suitable for reducing the pine. Almost complete pulping of both the hardwood and the pine resulted. The highest amount of screenings obtained was only 1.3 per cent.

Except for resistance to tear, the strength properties of the hardwood-pine pulps cooked en-mixture were practically equal to those of the kraft pulps obtained from the southern yellow pine alone. (J. S. Martin, *Southern Pulp and Paper J.*, December 15, 1943). In addition, the strength properties of 16-point liner boards made on the laboratory's fourdrinier paper machine from these hardwood-pine sulphate pulps, although slightly lower in tear and folding endurance, were equal in bursting strength and superior in tensile strength to the boards made from southern yellow pine only.

Ways of improving pulp yields is the second expedient mentioned for coping with the pulpwood situation. There are several factors which control the yield of sulphate pulp from various species. Perhaps the most important of these are the density of the wood, the stable cellulose content, and the cooking conditions employed.

Selection of high-density species is of paramount importance for improving the yield of pulp per cord and per unit of digester space as well.

Improvement in pulp yields may also be realized through the selection of species of high-recoverable cellulose content. The cellulose content of aspen, for example, often runs as high as 65 per cent; cottonwood, 63 per cent; black willow, 62 per cent; and sweetgum, 61 per cent. Even though some of these species are comparatively low in density, owing to their high cellulose contents, the yield of sulphate pulp per cord may be high, as for instance, 1070 pounds for aspen and 1210 pounds for sweetgum.

Another way of improving pulp yields is through control of the cooking conditions. The several variables, time and temperature of digestion, concentration of chemicals in the cooking liquors, and the ratio of chemicals to woods charged are the bases for controlling both yield and pulp quality with any species. Production of pulps as raw as can be blown from the digester and followed by refining to suit a particular use requirement should be the aim of kraft pulp manufacturers in the interest of yield improvement. For some purposes, these raw pulps may be as suitable as those cooked to lower yields.

High-yield pulping methods such as the sulphate semichemical process, which consists of a short cooking treatment followed by mechanical disintegration of the softened or partially cooked chips, should be of special interest to mills equipped to use them. The sulphate semichemical process is especially adaptable to the hardwoods. By using one-half the amount of sulphate cooking chemicals at one-half the concentration that is commonly employed in the commercial operation of the sulphate process, the Laboratory has obtained yields approximating 75 per cent (oven-dry basis) from a number of hardwoods. After refining the partially cooked chips in a Bauer mill or beater, satisfactory 9-point corrugating boards equal or better in strength to straw, pine groundwood, and chestnut-chip corrugating boards were made

from these high-yield hardwood pulps.

The utilization of such mill wastes as undersized chips, sawdust, slabs, chip-screen rejects, shavings, and veneer-mill waste for pulping is occupying the attention of some mill operators at the present time. Though these materials frequently produce pulps inferior to those made from round wood, they offer an important source of raw material as a means of continuing mill operation.

The problem confronting every sulphate pulp manufacturer today of procuring enough wood to keep the mill operating at an efficient level has arisen simply because the needed supplies of desirable wood are not being cut.

In the past, the sulphite pulping process has been restricted to a relatively small number of wood species (the spruces, firs, and hemlocks) because of its inability to reduce all species successfully or because the product from certain species which could be pulped did not have the desirable quality. For many years, however, the preferred species have been supplemented to a small extent in commercial operation by some of the hardwoods, such as aspen, cottonwood, birch, maple, and gum, and by the northern and southern pines. Also, results of researches on the pulping of the so-called "inferior" species by those interested in broadening the pulpwood base from an improved forestry angle have appeared frequently in the literature of wood pulping. Thus, there is abundant technical information as well as practical experience available on the most satisfactory pulping practices and uses of the sulphite pulps from the less desirable wood species, which for some time may be expected to form a substantial part of the wood supply for many mills.

In utilizing the less desirable species, pulp mill operation will undoubtedly be less satisfactory, screenings may be higher, the pulp may be darker, dirtier, and weaker, and the outlets will be more limited than when the more popular species are used. When the less desirable species are used in admixture with the spruces, firs, or hemlocks in amounts up to 25 per cent, however, the resultant pulps should not differ seriously from the pulps made entirely from the more-favored woods. The all-hardwood sulphites can be expected to be shivey, to be somewhat dark-colored in the unbleached state although they may be fairly readily bleached, to be lower in bursting strength by 20 to 40 per cent, and to be considerably lower in tearing strength than softwood sulphites.

In the bleached or semibleached state, the hardwod sulphites have considerable value as a filler pulp, contributing to formation and surface properties. Favorable outlets are in book, writing, and tissue paper; greaseproof paper has also been suggested. The pine sulphites have been reported to be suitable for use in wrapping paper, low-grade board, catalogue papers, and the like.

Logging, sawmill, and veneer mill waste may constitute a possible wood source for some sulphite pulp mills. This material will generally include the less desirable species and will come to the mill in various

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forms. Some of the waste material can undergo routine barking and chipping and be used along with the regular supply of pulpwood chips. It may be necessary, however, to subject material that is difficult to bark and chip to a separate digestion under conditions adjusted to the material at hand.

A waste material available in the pulp mill itself is the residue of coarse sawdust and pin chips from the slashing and chipping operations. Formerly, this material received no consideration because of its highly dirty nature and obviously short fiber length. Although the fiber loss in operations subsequent to pulping may be high, however, there is no question about obtaining sulphite pulp from coarse sawdust; but it appears necessary to cook it with at least 25 per cent ordinary-sized chips for satisfactory digester operation.

The pounds of pulp obtained from a unit weight of wood, or percentage yield, is appreciably influenced by sulphite pulping conditions. The lowest possible temperature that will give the desired pulping in a given time should be used since an increase of 5 C. may lower the yield 1 percent. Further, a high combined sulphur dioxide content in the cooking acid is reported to result in an increase in yield up to 2 per cent, mostly from increased retention of noncellulose carbohydrates. Thus, the spread between the most unfavorable and the most favorable conditions may amount to as much as 5 pounds of pulp from every 100 pounds of wood cooked.

In order to obtain the highest yield of screened pulp, it is necessary to keep screenings at a minimum. These may be reduced by insuring proper penetration. In inferior species, such as the pines, the screenings will be high from the heartwood, which is difficult to reduce. The screenings, however, have considerable value after mechanical defibering for use in board and coarse papers and are used for this purpose in many mills.

The possibility of getting a high yield of pulp in pounds from a cord of wood cut by use either of dense woods or of woods with a high cellulose content is described in the part of this article on alkaline pulping. The arithmetical arguments given there apply to sulphite pulping as well.

When considering the utilization of the less commonly used species of wood for groundwood pulping, it is customary to compare them with spruce. This generally results in an unfavorable impression since most of them are inferior to spruce for this purpose in one or more respects. A careful examination of their characteristics, however, will show that most of the less commonly used species have possibilities for the production of groundwood pulp for use in various grades of paper.

In discussions of the pulping of these less commonly used species, the woods are frequently classified as softwoods or hardwoods. When considering them for groundwood pulping, however, it is convenient to classify them into groups of lower density (that is, lower than approximately 27 pounds per cubic foot over-dry weight, green volume) and of higher density (above approximately 27 pounds per cubic foot).

Most of the woods that will be mentioned have an average density of about 24 pounds per cubic foot. On the basis of density, the yield of ground wood pulp per cord from the woods in this group will, therefore, closely approximate that obtained from spruce unless, of course, other growth characteristics, such as crook, knots, and bark, should influence the solid volume content of wood in the cord.

Jack pine has a limited use as groundwood pulp in some newsprint mills. Undoubtedly more could be used, not only in newsprint but also in other grades of paper. With careful grinding procedures, a fairly good quality of groundwood pulp can be made from jack pine. Under these conditions, the energy consumption per ton of pulp, like that for southern yellow pine, is from 15 to 20 per cent higher than that for spruce groundwood of comparable quality. Jack pine usually contains an appreciable amount of heartwood and is fairly knotty, which tends to darken the color of the pulp. Even though the proportion of jack pine groundwood that can be used in a furnish is probably limited because of a tendency to cause pitch trouble,

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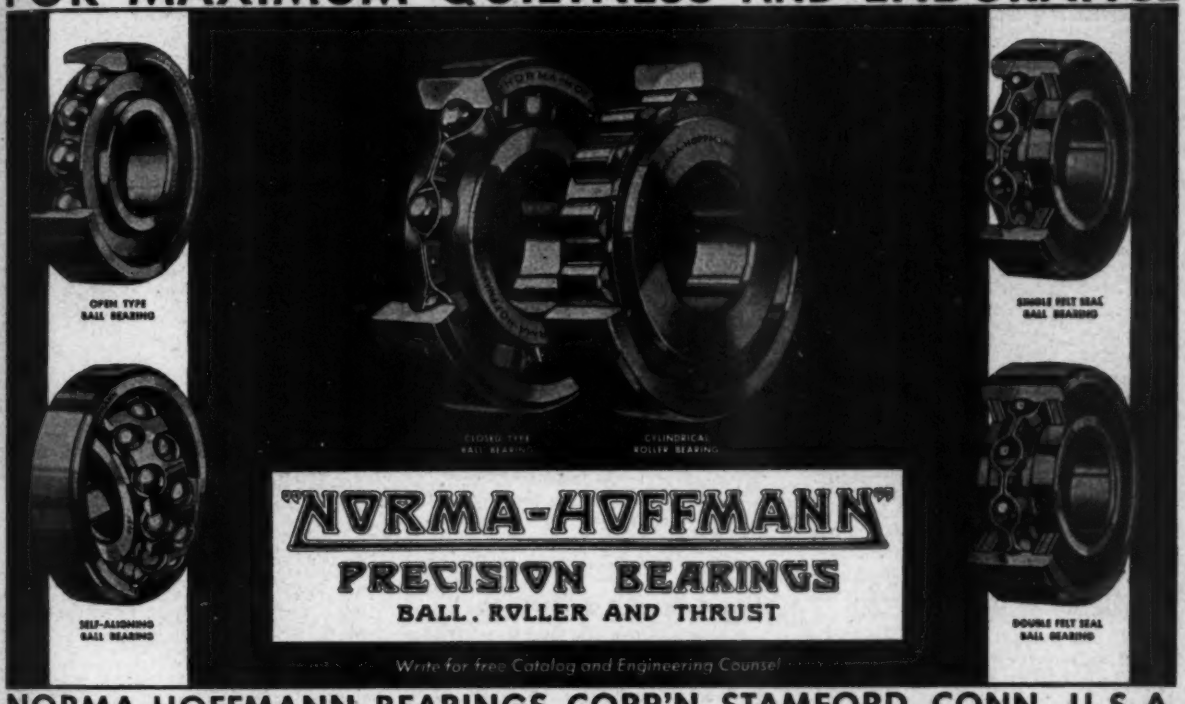

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it is believed that a more extensive use of this pulp is possible.

Eastern hemlock has been used for groundwood pulp to a very limited extent. In experiments made at the Forest Products Laboratory, fairly acceptable groundwood pulp was obtained from this species. It was found that the hemlock required a relatively dull stone surface. The production rate, the yield per cord, and the energy consumption approximated the average for spruce. The hemlock groundwood was, on the average, shorter fibered than that of spruce groundwood, and paper made with it was softer in texture than that containing spruce groundwood. The principal objection was the decided reddish tinge of the pulp, although experiments indicated that the pulp was not too dark colored for use as part of the groundwood furnish of newsprint paper or butchers' wrap.

Quaking aspen and cottonwood, both commonly called "poplar," are accessible to many groundwood mills, and now, since the war, a considerable quantity is used for grinding. The pulp has been used particularly in book paper, toweling, tissue paper, and other specialty products. A dull stone surface and the expenditure of considerable energy seems to be indicated to produce the best quality of pulp, but a high energy consumption is not necessary if a relatively bulky stock of lower strength will serve. The color of "poplar" groundwood tends to be gray, but this is not objectionable for many purposes.

The willows are quite similar to cottonwood in pulping characteristics. Willow and cottonwood are being ground for use in the manufacture of insulating board. For paper making, the color of willow groundwood is rather dark, but it undoubtedly could be used as filler stock in liner boards and other products where color is unimportant.

Basswood is another low-density, light-colored wood that might be mentioned. No data are available at the laboratory on the grinding of this species, but it could be expected to behave like aspen.

The higher density group includes one or two softwoods, but most of the species in this group are hardwoods. They are of interest not only because they may serve to alleviate pulpwood shortages, but because they potentially can yield from 25 to 30 per cent more pulp per cord than the woods commonly used. Potentially, yields are apt to be low because of white water fiber losses if the pulps obtained from some of them are not handled in the mill in an efficient manner.

Tamarack is a high-density softwood that is an exception to most of the other woods in this group because it produces groundwood pulp similar in quality to that of some of the lower density woods. In experiments on this wood, a good quality of groundwood was obtained. The energy consumption was slightly higher than that for spruce groundwood of comparable quality. Although the color of tamarack groundwood is decidedly gray with a greenish cast, it, like jack pine, probably could be used as a partial substitute for spruce groundwood in a number of furnishes.

The high density hardwoods, swamp tupelo, paper birch, green ash, and sugarberry, all produce very short-fibered ground wood pulps of comparatively low strength. The energy consumption per ton of pulp will not be unreasonably high if mill conditions are conducive to the maximum recovery of white water fiber. All have good color and can serve well as filler stocks in book paper and paper boards. Paper birch groundwood has been proven to be an excellent addition to toweling paper for the improvement of absorbency (Schafer, E. R. and J. C. Pew, *Paper Trade J. 116*, 4, 25-32, Jan. 28, 1943). Very probably the others could also be used for the same purpose.

Although American elm produces a short-fibered groundwood with low strength and dark color, it probably could be used as filler in paperboards.

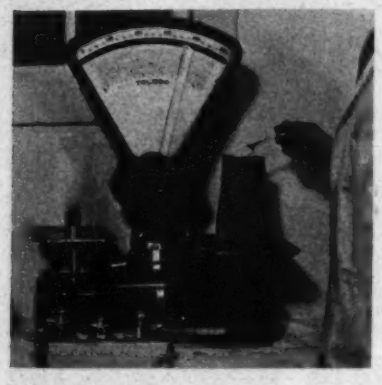
Beech and maple are also accessible. Little information on the grinding of these species is available, but from the general characteristics of the woods, they can be expected to grind somewhat like birch.

The Sixth War Loan will open November 20. Buy a bond for Christmas. Speed Victory and bring our men home.

NEW EQUIPMENT AND SUPPLIES

Laboratory Scale

Toledo Scale Company, Telegraph Rd., Toledo 12, Ohio, has announced the *Computagram* as a scale well-adapted for general laboratory use. The scale has a



sensitivity of ½ gram and a capacity of five kilograms. A combination avoirdupois-metric chart has a graduation and figure for every gram, also graduations as fine as 1/100 lb. The scale has a fully enclosed, dust-proof base. All parts are treated to protect them against corrosion and rust. Weight indication is rapid, a hydraulic dashpot controlling indicator oscillation. A hair-line indicator makes for easy reading. Models are available with either black or white lacquer finish.

Front Wheel Drive Motorized Hand Truck

Automatic Transportation Company, 101 West Eighty Seventh St., Chicago 20, Ill., has announced a new hand truck, the *Transporter*, which is a combination of a foot-operated hydraulic lift truck with electric power front wheel drive. This design includes two types of unit: namely,

the *Platform Type Transporter* for skid platform loads of 4,000 and 6,000 lb., and the *Fork Type Pallet Transporter* for pallet unit loads up to 4,000 lb.

Standard platform lengths for the 4,000 lb. and 6,000 lb. platform unit are 36 in. to 72 in. Standard widths are 20 in. and 26½ in., with heights 6 in., 7 in., 9 in., and 11 in. Lift from low to high position is 3½ in.

Standard pallet for lengths for the design are 30 in. minimum to 60 in. maximum in 2 in. steps. Standard width is 27 in., and fork height in low position is 3⅜ in. with 3¾ in. lift, elevated height is 7⅛ in.

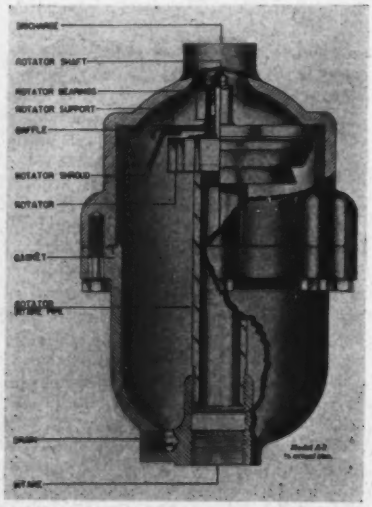
The platform or forks are hydraulically lifted by pump and ram action with easy foot lever operations. Conveniently located pedal provides means for lowering loads.

The drive control has forward and reverse speed push-button built into guide handle for thumb-tip control. Two speeds forward and two speeds reverse are controlled by raising and lowering the guide handle as required. Drive brakes are applied when the guide handle is moved to or returned to the upright position. Steering turntable is ball bearing mounted. Front wheel drive has double reduction chain drive from series type motor. A battery with power supply sufficient for operating truck 8 to 10 hours daily also is standard equipment. In addition, a portable cabinet plug-in type charging unit is available for recharging battery.

Compressed Air Purifier

Bird-White Company, 3119 West Lake St., Chicago, has announced a compressed air purifier under the designation of new Turbo-Roto Puro-O-Fier. The unit is made in two sizes—Model A-2 can accommodate volumes from 10 to 35 cubic feet; Model A-4, 35 to 100 cubic feet. For volumes above this range, multiple units are recommended.

In operation, air entering a unit from the intake pipe rotates a high speed, non-cushioning, balanced rotor (2 in. on Model

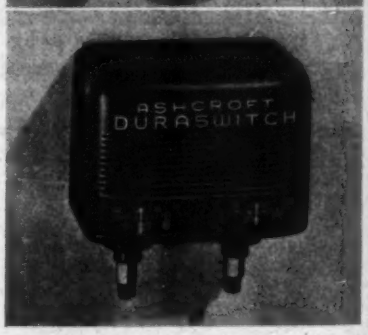


A-2, and 4 in. on Model A-4.) The rotor beats the atomized moisture and vaporized oil into larger particles. These particles are driven outward and downward by a shroud. As they cool, the entrainments are drained off by gravity into a reservoir designed for manual operation. (Units provided with automatic draining are also available to meet requirements.)

Openings at the top of the shroud discharge the purified air.

Combination Switch and Gauge

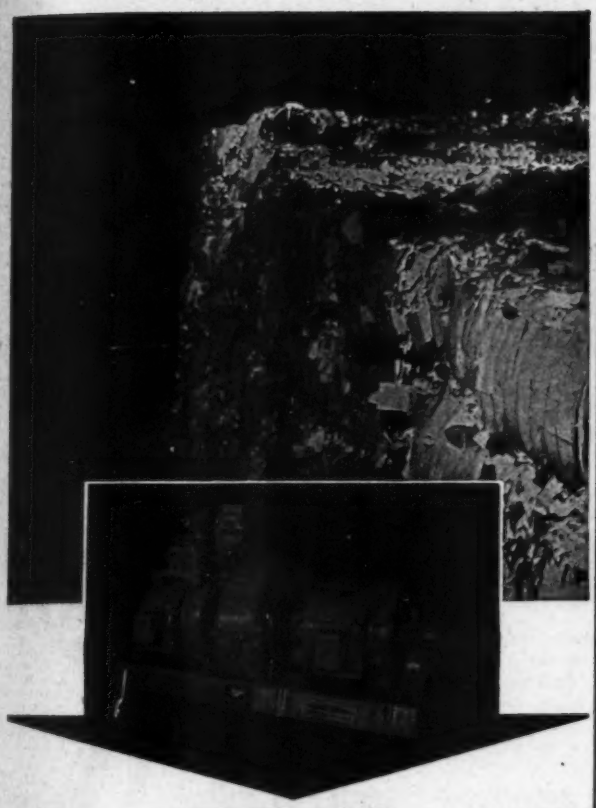
Manning, Maxwell & Moore, Bridgeport, Conn., has announced the new Ashcroft *Duraswitch* (Patent applied for) as a combination switch and Ashcroft gauge. The gauge has an easily readable dial for adjusting of switch to control point. The unit is available as Series E-100, or as Series E-200.



The series E-100 units are for pressure only, while series E-200 units are for both pressure and temperature applications, as a pressure control and pressure gauge combination, or temperature control and thermometer combination, in single or duplex types.

Glyceryl Monostearate

A white, edible glyceryl monostearate in bead form, known as *Bemul*, has been announced by the Beacon Company, 97 Bickford St., Boston. This product is completely dispersible in hot water, completely soluble in alcohols and hydrocarbon (hot), has a *p*H (3 per cent aqueous dispersion at 25 C) of 9.3 to 9.7, melts at 58 to 59 C. (capillary tube), and is non-toxic and practically odorless. The viscosity of its emulsions vary from a thick cream to a thin liquid, depending upon the solid concentration. Among other uses, the manufacturer suggests its use as a lubricant for paper and cardboard in dry die-forming and also as a suspending agent for organic or inorganic materials in aqueous solutions.



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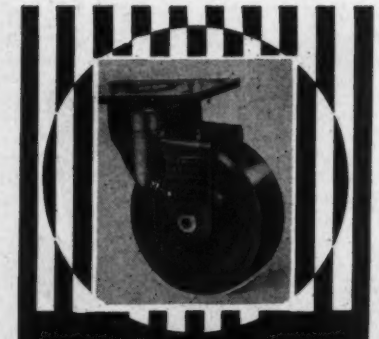

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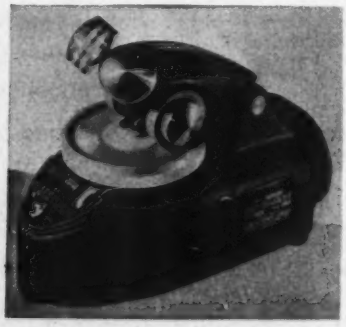
Hydraulic Vise

Reimuller Brothers Co., 9400 Belmont Avenue, Franklin Park, Ill., has announced a new Hy-Speed hydraulic vise. This vice, made in two sizes—4 ton with 4 in. opening, and 7 ton with 7 in. opening,

is made of high tensile semi-steel castings. The jaw plates are of hardened steel. The hydraulic unit, which is foot-controlled, has two levers, one to apply pressure, the other to release it. A flexible hose connects the foot control unit with the vise.

Specimen Table for Taber Abraser

Taber Instrument Corporation, North Tonawanda, N. Y., has announced a new specimen table for its Taber Abraser that permits testing of paper products in moist or wet condition. The table is stated to hold a sufficient amount of water to cover the specimen when performing wet tests on any type of paper or paper product.



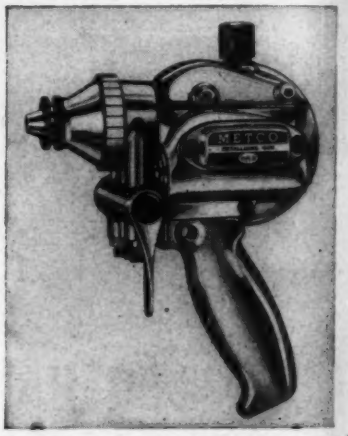
The wearing action of the instrument is performed by dual calibrase wheels bearing against the specimen under constant pressure, revolving in opposite directions, one sliding radially toward the outside, the other sliding toward the inside of the wear path. Each wheel revolving at a constant speed through contact with the specimen, exerts a combined abrasive, compressive and twisting action twice in each revolution of the specimen holder. A standardized load adjustment is provided for varying the pressure of the wheels against the specimens as desired.

The results of tests are reported either numerically as the number of "wear cycles" to produce a given amount of wear, or as "loss in weight" when weighed on a precision laboratory balance.

The instrument is self-contained. It is ready to operate by plugging into any electrical line.

Gun for Spraying Low Melting Point Metals

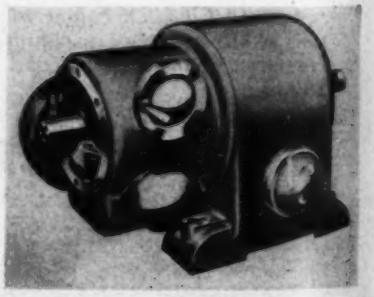
Metallizing Engineering Co., Inc., 38-14 30th Street, Long Island City 1, N. Y., has announced Metco Type 3E metallizing gun for the spraying of low melting point metals. Rates of deposition of this gun, in pounds per hour, include: zinc, 40;



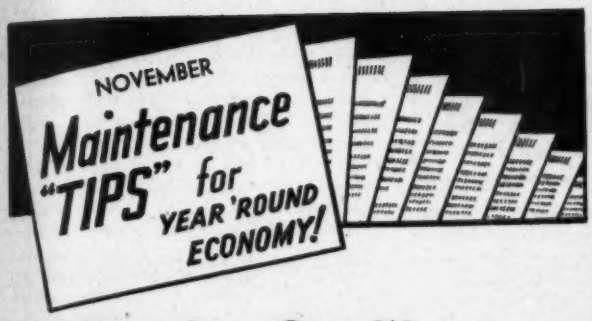
tin, 70; lead, 110; solder, 90; and babbitt, 75. Typical applications for the gun, according to the announcement, include: corrosion-resistant coatings on iron and steel structures and equipment; water and chemical-resistant linings for storage tanks; and conductive and soldering surfaces on glass, plastics, and carbon products.

Variable Speed Drive

A variable speed drive that utilizes conventional gearing methods for transmitting the power, and a V-belt for varying the speed ratio, has been announced by Lombard Governor Corporation, Ashland, Mass.



The drive is made in sizes from 1 hp to 100 hp and higher; and in speed ratios ranging from 1¼ to 1 to 70 to 0. Normally furnished with manual control handwheel or lever, the unit may also be had with remote control.



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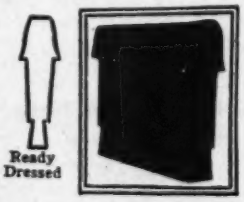

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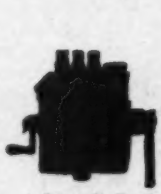
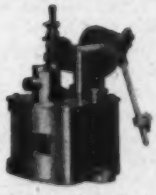
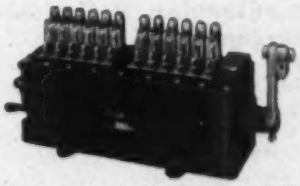


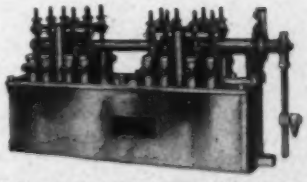
4 Pint, 3 Feed Model "ET", Type "VBF" Lubricator.



2 Pint, Single Feed Model "MB", Ratchet Driven Lubricator.



16 Pint, 12 Feed Model "ET", Type "VBF" Lubricator.



12 Pint, 16 Feed Model "MB", Ratchet Driven Lubricator.

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Evaluation of Parchment Paper

New requirements (1942) for parchment paper in Germany are given. Often the resistance of such papers to fat penetration parallels their resistance to air and water penetration. Tear and tensile strength are also of importance. Dry, wet, and alkaline bursting strengths are measured by procedures in accordance with DIN leaflet DVM 3412. Genuine parchment is usually superior to imitations in wet and alkaline strengths. The folding endurance should be high. The ultraviolet permeability may also be determined. The following specifications are given: moisture content not in excess of 12%, water-soluble matter under 10%, ash, less than 4%; heavy metals practically absent. Of essential importance are the following: weight per square meter, wet and dry bursting strength, fat resistance, water and air permeability, and sundry chemical data. In the original article (which is not available) tables give the results of 180 tests. G. Schwarz and B. Hagemann. Molkerei-Ztg. 56, 693-4 (1942) through Chem. Zentr. 1943, I, 1947 and C.A. 38, 4803 (1944).

Scandinavian Technical Developments

The following are discussed:—evaporation of sulphite waste liquors, combined evaporation of sulphite and sulphate liquors at Grycksbo, soda recovery in accordance with the Svenska Fläktfabriken, the development of Nyquist's disk evaporator for the complete drying of black liquor, the Ottersland chipper (with ten knives), a chip classifier for control work, an apparatus for separating knots from chips based on the fact that the knots are the heavier; the separation of fusel oil from sulphite alcohol; a stiffness tester for board and paper, developed by Sandell. Detailed descriptions and diagrams are given. The article is in Swedish without English abstract. O. Brauns. Svensk Papperstidn. 47, 305-11 (1944) through B. I. P. C. 15 55 (1944).

Paper Laminates

The applications of laminates will presumably be broadened by the use of melamine resins that appear to have replaced the ureas largely because they are superior in their resistance to water, heat and abrasion. Melamine contains 67% nitrogen, is almost insoluble in solvents other than boiling water and sublimes at 350 C. It decomposes, but only gradually, at much higher temperatures. Thus melamine-glass cloth laminates are perhaps the most resistant of the commercial plastic materials. An application that may play a leading role in paper plastics in the future is the surfacing of resin-bonded plywood with paper impregnated with melamine or phenolic resins. This may be done either to strengthen the plywood or to make it more attractive, or both. The probability (in England) is that the paper manufacturer will supply treated kraft or papers with a high alpha cellulose content to the plywood manufacturer. The paper thickness varies from 3 to 15 mils or more.

All types of color combinations may be obtained. The wood grain may be completely concealed by the use of pigmented or kraft papers. However by using a melamine alpha paper overlay, the wood grain may be brought out through the translucent sheet. Potential markets for these laminates are interior and exterior wall panelling, and furniture. Translucent laminates may also be used in the lighting field. Whereas all work is still in the development stage, it appears too that the weather resistance of melamine resins is sufficiently high for use out-of-doors. F. W. Griffith. Bristol Plastics 16, No. 181, 257-9 (1944); through B.I.P.C. 15, No. 1, 25 (1944).

Terpene Removal from Sulphite Alcohol

One of the most difficult problems in making potable ethyl alcohol from sulphite wastes involves the removal of the terpenes. The present article describes a continuous five column still equipped with 46 baffle plates, the first column of which permits this separation.

The author gives tables showing the percentage of alcohol that is present at various "plates" of the still. Between plates 18 and 23 the alcohol content increases sharply from about 32% to 89%. The terpenes which are readily soluble in alcohol but which are difficultly soluble in water are thus in solution at plate 23 but tend to separate on plate 20. An important consideration is that whereas the terpenes are insoluble in water they distill readily with steam at a temperature below 100 deg. Hence they separate only when the mixture condenses. On the other hand, whereas they dissolve in alcohol they do not distill with alcohol, so they may be separated from their alcoholic solutions by fractional distillation when the water content is low. It is for this reason that the terpenes separate at that section of the stillhead which lies between plates 20-23, and why they can be withdrawn most readily in this zone.

Nilsson found that in separating methanol from ethanol (obtained in the sulphite process) it was best to withdraw the high grade alcohol somewhat higher in the stillhead than is the common practice. The lower grade alcohol was withdrawn at the bottom and showed far more impurities as indicated by the permanganate test. This has since been confirmed. The impurities appear to be due in part to terpenes which can thus be removed from the purer grade alcohol. When sulphite alcohol is washed with potassium and sodium acetates (according to the Hiag method), there is a gradual separation of a pitch-like product which is deposited in the still. This appears to be due to terpenes in the acetate solution. This pitch-like formation is obviated if, in the original distillation the alcohol content is kept about 96% (or more). Under these conditions the terpenes remain largely with the fusel oil. In another article, it was shown that in purifying sulphite alcohol by distillation, the terpene fraction had a practically constant boiling point of 175 deg. C. The terpene that predominated was shown to be dextrolimonene, and this seems to be the first time that this product has been obtained from Swedish spruce. Its possible genesis is discussed. First paper by Sigge Hähnel. Svensk Papperstidn. 47, 75-6 (1944). Second paper by Nils Hellström, Ibid. 47, 73 (1944); through B.I.P.C. 15, 42-3 (1944).

Mineral Fillers in Roofing Papers

The beneficial effect of a filler on the viscosity of coal-tar pitch (used in German roofings) depends largely on the shape of the filler particles. Those that have no definite structure (for example: powdered lime) exert only a hardening effect and increase viscosity in proportion to their specific surface. Fillers however with rodlike and fiber-shaped structures exert also a plasticizing effect on the tar mixtures. Under limited mechanical stress, such mixtures are very resistant to flow, but under high stress they are plastic and may be kneaded without cracking. The stabilizing effect of fillers that have a plate-like structure lies somewhere between these two other extremes. Horst Walther. Mitt. Dachpappen-Ind. 15, 69-100 (1942); through Chem. Zentr. 1943, II, 389.

◆

"Bahia" in Pulp Manufacture

Goldsmid reported unsatisfactory pulp from bahia (Mitragyna macrophylla) when the soda process was used. The present author however gives data that are somewhat different. The sulphite process gives pulp that is poor in quality and yield but which has an alpha content that makes its use in rayon manufacture possible. The alkaline processes gave normal pulp yields and pulp of usual quality. Best results were obtained with caustic soda to which sulphur had been added in the cook. The per cent caustic soda was 20% and 2.5% sulphur was used. The cooking time was 5 hours and the maximum temperature was 165 deg. The yields under these conditions were approximately the same as with the ordinary soda cook, but pulp quality was better. The fiber lengths of bahia pulp were 2.1 mm. (average) and the width 0.02 to 0.025. In admixture with spruce pulp (or alone), bahia fiber yielded good writing and parchment papers. G. Rosen, Chimie et Industrie, 49, 136 (1943); through Chem. Zentr. 1943. II. 2027.

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TRI-UMPH all cotton, 3 ply 53 oz., widths up to 250".

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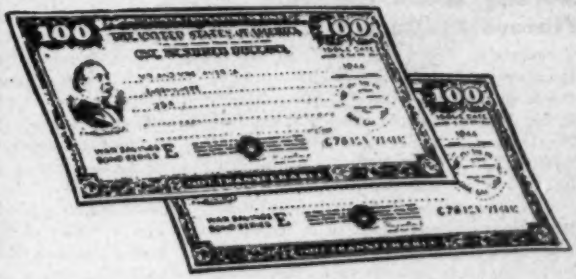

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PAPERMAKING PATENTS

IN THE UNITED STATES—Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington 4, D. C.

Method of Making Low Density Water Resisting Fibrous Products

Patent No. 2,332,369. John O. Burton, International Falls, Minn., assignor to Minnesota and Ontario Paper Company, Minneapolis, Minn., a corporation of Minnesota. No Drawing. Application September 27, 1941, Serial No. 412,686. 6 Claims. (Cl. 92—21).

4. The process of manufacturing vegetable fiber structural units of a density of from about .75 to about 5 pounds per cubic foot comprising adding waste ligno-cellulose cooking liquor to vegetable fibers in a water suspension, adding a material of the kind described to the fiber suspension to adjust the *p*H thereof, to substantially set the isoelectric point of the colloids of the waste cooking liquor whereby stable foam is produced after agitating and aerating the fiber suspension to distend the fibrous mass, forming a structural unit and drying the unit.

Apparatus for Conditioning Paper

Patent No. 2,337,163. Samuel Milne, Edinburgh, Scotland; Samuel Hird Milne and John Innes Melvin executors of said Samuel Milne, deceased. Application December 11, 1940, Serial No. 369,627. In Great Britain June 22, 1939. 1 Claim. (Cl. 92—76).

The combination in a paper making machine of means for treating a relatively hot and dry web as it comes from a calender comprising, upper and lower rows of spaced smooth-surfaced cooling cylinders arranged whereby a paper web may pass around the cylinders of the rows alternately so that its opposite surfaces are contacted with said cylinders, said cylinders being cooled by flowing cold water therethrough, endless felts one for each row of cylinders arranged to press a web into contact with the cylinders of their respective rows, said felts being adapted to contain moisture to be applied thereby to a web between said felts and cylinders, means for applying moisture to said felt, all adapted and arranged whereby the web as it passes over said cylinders has its opposite surfaces contacting the cylinders alternately and moisture applied to a surface opposite to that in contact with the cylinders.

Paper Coating Device

Patent No. 2,333,902. William F. Thiele, Wisconsin Rapids, Wis., and Warren E. Beadle, Sr., deceased, late of Wisconsin Rapids, Wis., by Warren E. Beadle, Jr., administrator, Biron, Wis., assignors to Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., a corporation of Wisconsin. Original application May 31, 1939, Serial No. 277,460. Divided and this application December 8, 1941, Serial No. 422,040. 5 Claims. (Cl. 91—48).

2. A device for coating paper which comprises a pair of juxtaposed rolls, dams positioned adjacent the ends of said rolls to provide a zone at the nip of said rolls for carrying a quantity of coating material, means for rotating said rolls to apply coating material to the surfaces of said rolls, the surfaces of said rolls being in contact with a surface of a traveling web of paper whereby coating material is transferred from said roll surfaces to said web surface, and means for holding said traveling web in contact with both roll surfaces during passage of the web.

Inlet System for Paper Machines

Patent No. 2,347,130. Frederick S. Seaborne, Harrison, Wis., assignor to Paper Patents Company, Neenah, Wis., a corporation of Wisconsin. Application January 29, 1941, Serial No. 376,460. 2 Claims. (Cl. 92—44).

1. In paper making apparatus, a forming wire, and inlet means for delivering a uniform, evenly mixed stream of liquid stock to and across the breadth of said wire, said inlet means comprising stock supply means, a nozzle for discharging stock on said wire, an elongated closed conduit having a passageway of slot-shaped cross-section connecting said stock supply means and said nozzle, the major dimension of said slot approximating the width of the stock stream discharged through said nozzle, the minor dimension of said slot in a zone spaced from said discharge means, being constricted in a manner to provide the passageway with a Venturi-shaped portion.

Fourdrinier Machine With Flexible Side Rails

Patent No. 2,336,497. Samuel Milne, Edinburgh, Scotland; Samuel Hird Milne and John Innes Melvin executors of said Samuel Milne, deceased. Application January 23, 1940, Serial No. 315,259. In Great Britain July 26, 1938. 3 Claims. (Cl. 92—45).

1. The combination in a paper making machine of, stationary supporting frames at opposite ends of the paper machine each having spaced relatively immovable members to which opposite ends of a pair of side rails may be secured, members associated with each supporting frame movable back and forth horizontally thereon to which opposite ends of rails may be secured, separate means at opposite ends of the machine connected to said movable members for moving them back and forth, spaced flexible continuous side rails at the sides of the machine extending between said supporting frames, spaced tie members extending between said rails intermediate the ends thereof secured thereto for tying said rails together, and connecting means associated with opposite ends of said rails and the immovable members and movable members at the ends of the machine for connecting said rails at opposite ends to said members thereby to support the rails from end to end, the said side rails being in cross-section of greater dimension in one direction than a direction transverse thereto with the greater dimension disposed vertically whereby the said rails are flexible horizontally throughout their length, all adapted and arranged whereby either end of the rails may be connected to the immovable or movable members adjacent thereto.

Jordan Shell Filling

Patent No. 2,335,841. Dwight E. Jones, Pittsfield, Mass., assignor to E. D. Jones & Sons Company, Pittsfield, Mass., a corporation of Massachusetts. Original application May 25, 1939, Serial No. 275,769. Divided and this application September 4, 1941, Serial No. 409,552. 1 Claim. (Cl. 92—27).

A preconstructed lining section for a Jordan engine shell comprising in combination, a plurality of alternate spacers and metallic bars disposed closely adjacent one another with the edges at one side of the bars disposed beyond the longitudinal edges of the spaces to provide spaced longitudinal working faces, said bars intermediate their ends provided with aligned openings, washers secured to the bars having openings in alignment with those of said bars, said spacers having receivers in the sides thereof adjacent said bars receiving said washers, continuous rod members extending through the openings in the washers and bars welded to the washers to hold said rods against longitudinal movements.

Pulp Screen

Patent No. 2,337,113. Nelson M. Knight, Boston, Mass., assignor to Wilfred B. Mathewson, Weymouth, Mass. Application October 22, 1941, Serial No. 416,081. 12 Claims. (Cl. 92—34).

2. A pulp screen comprising a casing, a vertical cylinder screen within the casing, a cylindrical rotor concentric with the screen and exterior thereto, said rotor having a cylindrical wall which divides the space between the screen and the casing into an annular inner chamber and an annular outer chamber, said casing having in its upper end an inlet through which unscreened pulp is delivered to the inner annular chamber and also having in its lower end an outlet for the screened pulp which passes inwardly through the screen, means to rotate the rotor and thereby cause the pulp in the inner annular space to rotate about the screen, whereby the centrifugal force thus developed forces the heavy particles outwardly toward the rotor wall, and means to recirculate the portion of the pulp containing such heavier particles upwardly through the outer annular space and back into the inner annular space

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New Catalogues and Publications

Askania Regulator Co., 1603 S. Michigan Ave., Chicago 16, Ill.—Just off the press is Bulletin 120, describing the new Askania Power Unit, which has been designed to extend the range of uses for air operated controllers. The folder is well illustrated with drawings and charts.

J. J. Berliner and Staff, 212 Fifth Ave., New York 10, N. Y.—The latest catalogue of Berliner Chemical Surveys includes a list of reports on paper, and also on resins, plastics and rubber.

The Bristol Co., Waterbury 91, Conn.—A well illustrated booklet, including schematic diagrams and drawings, has been issued by this company to describe its radiation pyrometers. Ask for Bulletin DMO11.

Clark Equipment Co., Buchanan, Mich.—Just announced by this company is a 32-page, three-color miniature booklet descriptive of its products, from drills and reamers to fork trucks and industrial tractors. Also included are air views of the company's four plants. Requests for this booklet must be made on company stationery.

Denver Equipment Co., 1400 Seventeenth St., Denver 17, Colo.—Bulletin G 3-B18 contains a map showing the company's branch offices and representatives all over the world. The folder also includes photos of some of the plants of this company. Bulletin B2-B4 covers Denver steel head ball-rod mills, and is complete with diagrams and tables, as well as photographic illustrations. An unusual feature is a slide rule to determine proper size of Denver Ball Mill to grind tons of ore to the desired mesh.

The B. F. Goodrich Co., Akron, Ohio—Available on request to this company is a new catalogue on its Punch-lok clamps and fittings, which are available for many purposes. A special feature is the pictorial description, together with tables giving information on all sizes. Tools used in applying Punch-lok clamps and fittings are also described. Also available is a new catalogue section on its line of milled sponge rubber products. The section describes sponge made from either synthetic or reclaimed rubber, and lists sizes, weights and other valuable data in tables. The Diamond Rubber Division of the B. F. Goodrich Company has issued a four-page folder on wire grommet V-belts. The booklet explains and pictures the construction of the wire grommet V-belt and outlines its advantages in handling tough transmission jobs.

Harbison Walker Refractories Co., Farmers Bank Bldg., Pittsburgh 22, Pa. Illustrated in colors, a folder just issued by this company describes the refractories which are produced at its Kentucky-Southern Ohio plants. It also contains information concerning the Insulating Fire Brick and High Temperature Bonding Mortars which are made in other plants.

Lyon-Raymond Corp., 1874 Madison St., Greene, N. Y.—Bulletin 137, describing hydraulic devices engineered and developed for specific applications is now available.

Photovolt Corp., 95 Madison Ave., New York 16, N. Y.—A folder pertaining to photoelectric pH determination with the company's Lumetron Colorimeter Model 400 is now available on request. This technimal literature will be of special interest to those who need accurate equipment for pH control, and are not eligible to purchase the electronic type of instruments.

Books

Bolt, Nut and Rivet Standards—Compiled by the American Institute of Bolt, Nut and Rivet Manufacturers, has been published as an aid to production in manufacturers' plants and as a service to users in acquainting them with accepted standards of nomenclature, dimensions, sizes, and other practices. Many of the standards have been developed and approved through the procedure of organizations such as the American Standards Association and the Division of Simplified Practice of the U. S. Department of Commerce, with the participation of manufacturers, and acknowledgement is made in each case. The remainder have been prepared by the Institute with the co-operation of users and both member and non-member manufacturers. In brief, the contents cover: Wrench Head Bolt, Screw and Nut Dimensions; Wrench Openings; Carriage, Plow, Stud, and Other Bolts; Thread Length and Length Tolerance of Bolts; Slotted-Head Machine, Cap, and Wood Screws; Screw-Thread Dimensions and Tolerances; Small Rivets; Large Rivets; Hold-on (Rolly Bar) and Rivet Set Impressions; Weights of Rivets; and Full-Container and Package or Carton Packing of Bolts and Nuts Data. The price of the book is $1.00 a copy; the source, the American Institute of Bolt, Nut and Rivet Manufacturers, 1550 Hanna Building, Cleveland 15, Ohio.

Forestry on Private Lands in the United States—Written by Clarence F. Korstian, Dean, School of Forestry, Duke University, after a nation-wide study of forest conditions, undertaken at the invitation of the National Lumber Manufacturers Association, this book reviews thoroughly the private land situation in each of the four forest regions and eight states included in the study, along essentially similar lines of treatment. The forest regions are: The Northeast, the Lake States, the South, and the Pacific Northwest; the states, New York; Michigan, Wisconsin, Virginia, Alabama, Arkansas, Oregon, and Washington.

Following this extensive review, Dr. Korstian takes up measures suggested to remedy the private forestry situation. In this connection, he discusses such subjects as: Adequate Control of Forest Fires, Public Control of Public Use of Private Forests, Extension of Public Programs of Education and Co-operative Assistance to Private Forest Land Owners, Cooperative Sustained Yield Management Units, Equitable Forest Taxation, Forest Credits, Public Control of Cutting Practices on Private Lands, and Constructive Forestry Programs by National and Regional Forest Products Industries Associations. The book, totaling 268 pages, is priced at $1.00 a copy with paper cover, $1.50 a copy with cloth cover. It is available from School of Forestry, Duke University, Durham, N. C.

Uses and Applications of Chemicals and Related Materials (Volume II)—Compiled and edited by Thomas C. Gregory, specialist in chemical market and literature research, this volume, both complements and supplements Volume I. It covers more than 2600 chemical and related materials which were not treated in Volume I. In addition, it includes several indexes as a new feature. These indexes are: Index of Uses (classified applications of 7809 chemicals and related materials); Index of Synonyms and Cross References (common and uncommon names by which chemicals and related materials are known); Index of Patents (patent numbers covering some uses, cited in Volumes I and II, together with their ownership); and Index of Addresses (addresses of owners of patents listed under Index of Patents). Published by Reinhold Publishing Corporation, 330 West 42nd Street, New York, N. Y., the book is priced at $9.00 a copy.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC. REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933.

Of The Paper Industry and Paper World, published monthly at Chicago, Illinois, for October 1, 1944.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared A. Scott Dowd, who, having been duly sworn according to law, deposes and says that he is the business manager of THE PAPER INDUSTRY AND PAPER WORLD and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit.:

1. That the names and addresses of the publisher, editors, and business managers, are: Publisher, Fritz Publications, Inc., 59 E. Van Buren Street, Chicago, Ill.; Editor, Besse Merrithew, 59 E. Van Buren Street, Chicago, Ill.; Editorial Director, Harry E. Weston, 59 E. Van Buren Street, Chicago, Ill.; Business Manager, A. Scott Dowd, 59 E. Van Buren Street, Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent of more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given. Fritz Publications, Inc., 59 E. Van Buren Street, Chicago, Ill.; Mrs. Annie C. L. Fritz, 6801 S. Crandon Ave., Chicago, Ill.

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5. That the average number of copies of each issue of this publication sold or distributed, through the mail or otherwise, to paid subscribers during the twelve months preceding the date shown above is.....

(This information is required from daily publications only.)

A. SCOTT DOWD
(Signature of business manager.)

Sworn to and subscribed before me this 28th day of September, 1944.

[SEAL] THOMAS H. STEVENS, Notary Public

(My commission expires June 24, 1947.)

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OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

	per cwt.
Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Headings	-7.25
White Shrunk	-6.00
Silesias No. 1	-6.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-5.00
White	-14.00
Grey	-14.00

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f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shappories	

ROPE and BAGGING

f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	2.75 to 3.00
Wool Tares—	
Light	3.00 to 3.25
Heavy	3.25 to 3.50
No. 1 Scrap Bagging	2.75 to 3.00
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95 00
No. 1 small	-*80.00
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.50
Domestic	5.50 to 5.75
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft jute	5.00 to 5.50
Mixed	1.50 to 2.00

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment for machine compressed bales weighing not less than 500 pounds (with differential of $5 per ton less on certain grades for loose or bundled stock), and brokers' allowance of 4 to 9 per cent.

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, No. 1	57.50-
Soft White, No. 1	50.00-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Books and Magazines	38.50-
Mixed Books	22.00-
Ledger Stock—	
No. 1 White	46.00-
No. 1 Mixed (Colored)	40.00-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	39.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissue	22.00-
No. 1 Baled	20.00-
Old Corrugated Containers	28.00-
New Corrugated Cuts	18.00-
Mill Wrappers	22.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	19.00-

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	24.00 to 24.75
80-100 mesh (bags), lb.	—
Argentine, lb.	18.00 to 20.50
China Clay—	
Domestic Filler Bulk (mine) ton	7.50 to 15.00
Domestic Coating Bulk (mine) ton	11.00 to 22.00
Imported (ship side) Bulk (lump) ton	14.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicia), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	6.55-
F	6.65-
G	6.69-
WW	7.45-
Rosin (Wood), carlots	4.18-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.72-
Pearl, barrels, cwt.	3.83-
Paper (Sp.) bags, cwt.	3.83-
barrels, cwt.	3.92-
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to ——
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.5.60 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo. (West of the Continental Divide and in Denver, Colo., ceilings are $5 per ton lower):

Bleached softwood sulphite	86.00
Unbleached softwood sulphite	74.00
Bleached hardwood sulphite	83.50
Unbleached hardwood sulphite	71.50
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	65.50
Bleached soda	72.00
Unbleached soda	68.00
Ground wood pulp	50.00
Ground wood—paper machine dried and mutilated	53.00
Sulphite screenings	43.50
Sulphate screenings	38.00
Ground wood screenings	32.00
Northern unbleached sulphate sideruns	73.00
Southern unbleached sulphate sideruns	63.50
Standard news print sideruns	50.00

PAPER

f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	48.00-
Chip, tube and can	50.00-
Chip, full-bending	52.50-
Chip, sgl. mla. lined	60.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	63.00-
News	48.00-

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)	
Book, White (M. F.)—	
A Grade E. F	8.25
B Grade E. F	7.80
C Grade E. F	7.55
D Grade E. F	7.30
E Grade E. F	7.05
No. 2 Uncoated Offset 4 sides. White	8.45
Coated White (Trimmed 4 sides)	
No. 1 Glossy	11.90
No. 2 Glossy	10.85
No. 3 Glossy	10.15
No. 4 Glossy	9.80
No. 5 Glossy	9.30
C2S Offset	10.40
C1S Litho (Varnish)	10.05
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b mill with zone, quantity, packing and other differentials allowed:

	per cwt. 20 lb.	16 lb.
Rag Content Bond—		
Extra 100% Rag	34.00	34.00
100% Rag	28.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.25
25% Rag	14.00	15.00

	per cwt. Zone 1
Rag Content Ledger—	
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.00
75% Rag	21.00
50% Rag	17.00
25% Rag	15.00

	per cwt. 20 lb.	16 lb.
Sulphite Bond—		
Air dry, watermarked	12.75	13.70
No. 1 (M. F.) watermarked	9.00	9.70
No. 2 (M. F.) watermarked	8.25	8.85
Plain (M. F.) unwatermarked	7.60	8.20

	per cwt. Zone 1
Sulphite Ledger—	
No 1 (M. F.) watermarked	10.00
No. 2 (M. F.) watermarked	9 25
Plain (M. F.) unwatermarked	8.60

	per cwt.
Glassine (f. o. b. mill)—	
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50

	per ton
News—OPA Ceilings	
Rolls, Standard (Contract)	58.00
Rolls, Lightweight (Cont.)	62.00
Rolls (Spot)	(nominal)
Sheets	66.00

	per ream
Tissues (Carlots)—	
White, No. 1	1 12½ to 1.20
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Bleached Anti-Tarnish	1.15-
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Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.00-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.60-
Toilet, Bleached (M shts.) per cs.	5.65-
Toilet, Unbleached (M shts.) per cs.	4.25-

	per case
Towels—	
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05

	per cwt.
Wrappings (Kraft)—	
Super-Standard	5.25 to 7.65
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Standard Bag	4 37½-

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	per cwt.
Bleached papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
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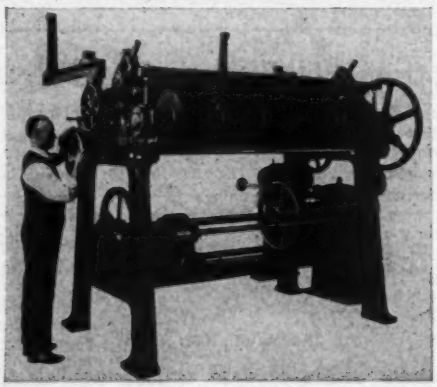

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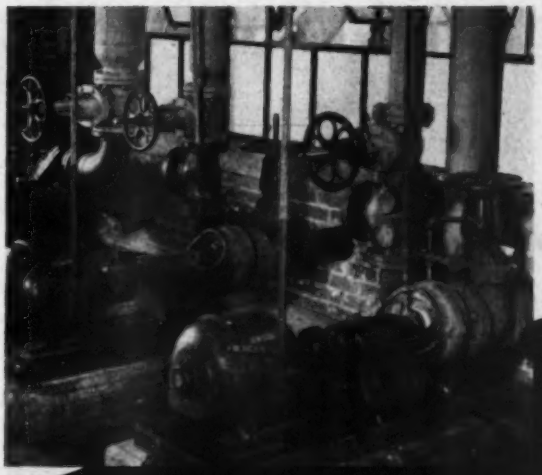

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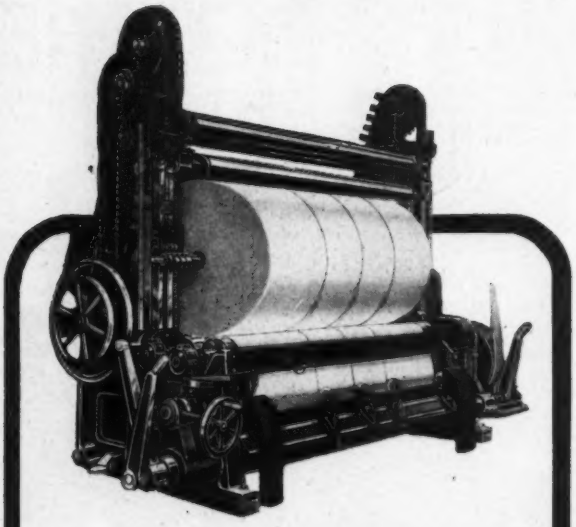

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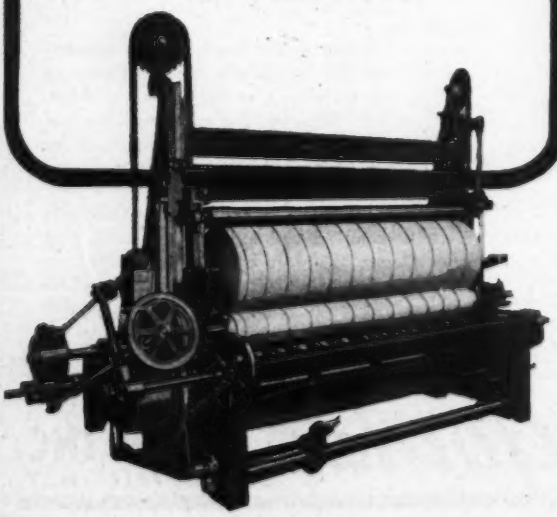

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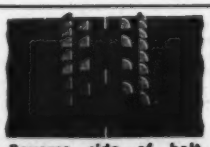

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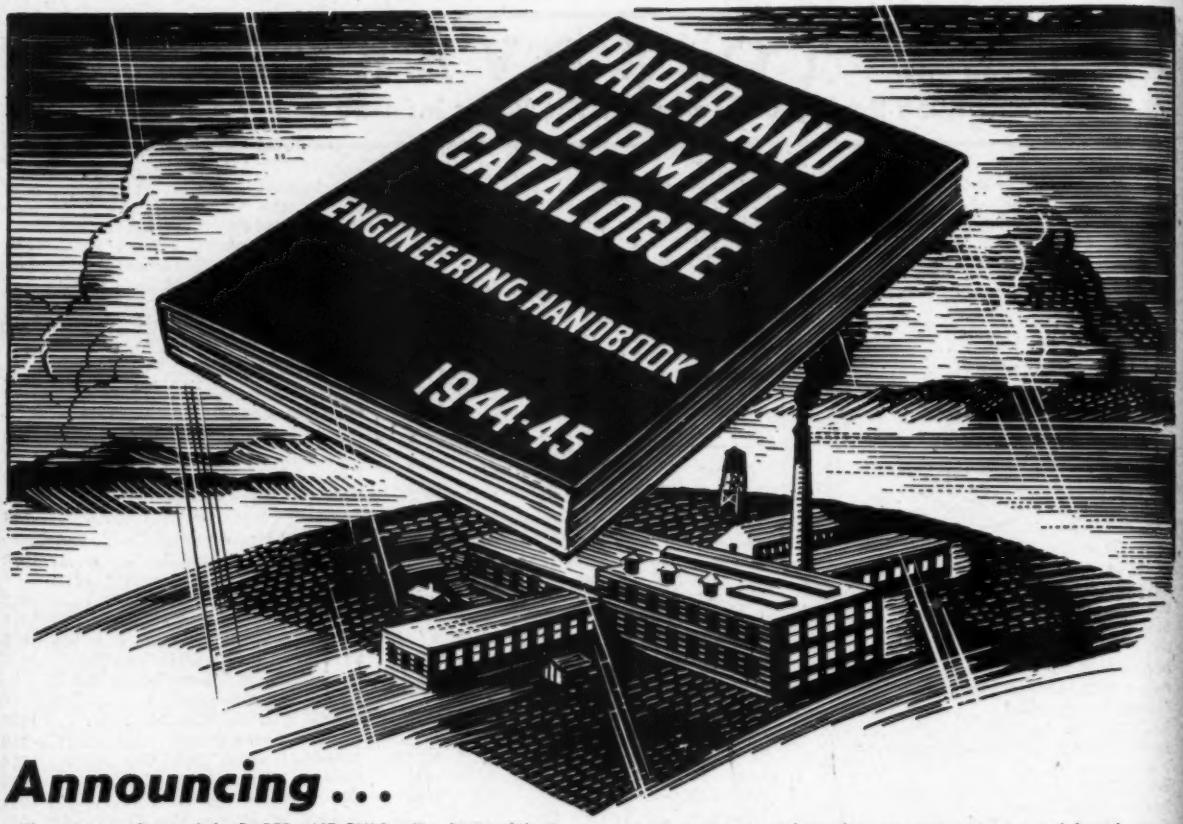

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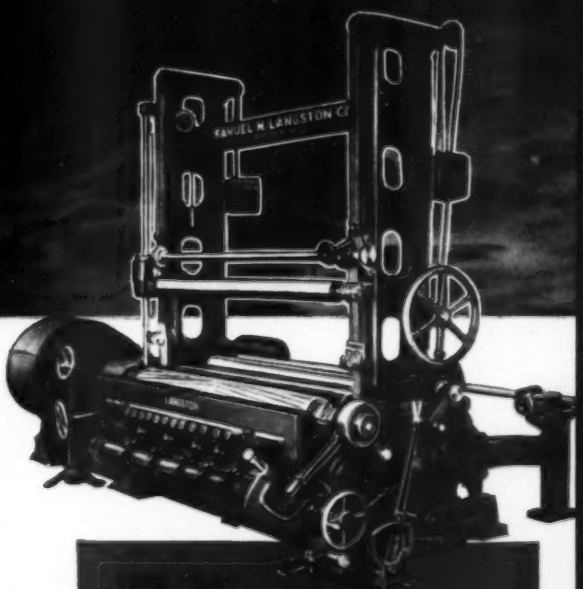

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